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Notice Hill Publishing

September, 1939

Price M Cents



GROUP APARTMENT PROJECT illustrated above of tise reinforced concrete frame structures known as Castle Village, New York.
City, required special methods and equipment for carrying on work during freezing weather.

COLUMNS OF STEEL ANGLES are structural tenture of another metropolitan apartment group of eight story fireproof buildings, called Park Terrace Gurdens. Navel design reduced steel tourings and lowered costs.

In This CANTILEVER METHOD OF BRIDGE ERECTION was followed on main 300 ft. tress span of Meeker Ave. bridge. Speedy work was done in setting 17,000 tans-of steel in less than four months.

BIG DOUBLE-DRUM PAVING MIXER of 34 E capacity helped contractor build 30 ft wide concrete slab for three-lane highway in Wisconsin.

UNDER-RIVER CROSSING involved group of six pipe lines laid



Up-stream view from below Soto Street showing trapezoidal and vertical walled channel, with the business section of Los Angeles in the distance. (Photo by California National Guard, 115th Observation Squadron, 40th Division).

A Mountain Stream goes to town.. Safely Escorted by INLAND PILING

• Streams that flow through busy metropolitan areas must be city-broken, their costly flood hazards removed. This operation was recently accomplished with the aid of Inland Piling on the Los Angeles River that flows through Los Angeles, California, on its way from the San Gabriel Mountains to the Pacific. The work was done in connection with the Glendale Flood Control projects.

Approximately 5,000 tons of Inland Piling were used to protect a new trapezoidal walled channel from the undercutting of flood waters. Installation of piling was completed at astonishingly high speed—aided by Inland's scientifically designed interlock, the uniformity of Inland sections, and toughness of the steel used in making Inland Piling.

These advantages are an assurance of low costs in any piling job. You can further increase your chances for savings by consulting Inland Engineers . . . whose broad range of piling experience is yours for the asking, at no cost, from the earliest planning stages.



Inland Steel sheet piling in place at the toe of



Driving the Inland Piling wall near Dayton Ave.
(Photo U.S. Engineer, Los Angeles.)

TECHNULOGY DEPTI

INLAND STEEL CO.

38 South Dearborn Street, CHICAGO . District Offices: DETROIT . NANSAS CITY . MILWAUKEE . ST LOUIS . ST PAUL

CURRENT JOBS

. . . and Who's Doing Them

Among recent contract awards for highways are the following: By Penn-sylvania Turnpike Commission, \$1,114,-Among recent contract awards for highways are the following: By Pennsylvania Turnpike Commission, \$1,114,324 to J. H. Swanger, of Lancaster, Pa; \$1,213,589 to Johnson, Drake & Piper, Inc., of Freeport, N. Y.; \$681,650 to Shullo Construction Co., of Akron, Ohio; \$487,420 to L. M. Hutchinson, of Mt. Union, Pa; \$730,711 to Union Paring Co., of Philadelphia, New York: \$739,303 to Lane Construction Corp., of Meriden, Conn.; \$942,660 to Ottaviano & MacDonald, Inc., of Croton-on-Hudson, Mississippi: \$217,344 to W. G. Cook, of Forest, Miss.; \$152,980 to Hardaway Contracting Co., of Columbus, Ga.; \$505,806 (four contracts) to Hodgkin-Adams Co., Inc., of Winchester, Ky. Ohio: \$260,622 to H. Candel, Bucyrus, Ohio. Illinois: \$279,018 to Hurden Construction Co., of Springfield; \$198,628 to Arcole Construction Co., of Chicago, North Carolina: \$258,933 to W. F. Bowe, Jr., of Augusta, Ga.; \$134,971 to Brown Paving Co., Charlotte, N. C. New Jersey: \$257,570 to the Salmon Bros., Netcong, N. J. Oklahoma: \$339,954 to Standard Paving Co., of Tulsa. Minnesota: \$181,021 to C. F. Sculley Equipment Co., of St. Paul. Virginia: \$535,628 to the Codell Construction Co., of Winchester, Ky.; \$586,755 to Sutton Construction, Inc., of Radford, Va. Michigam: \$161,533 to I. L. Whitehead, of Sault Ste Marie. Connecticut: \$303,333 to Oneglia & Gervasini, of Torrington, Conn.; \$193,052 to New Haven Road Construction Co., of New Haven Texas: \$113,435 to Austin Road Co., of Dallas.



Low bidders for two sections of Chicago's new subway totaling respectively \$6,436,855 and \$8,212,835 were submitted by **Healy Subway Construction Co.**, of Chicago. At a price of \$15,486,150 contract for Lackawack (Ulster County) dam for Board of Water Supply, City of New York, was awarded to **Mason & Hanger Co.**. Inc., of New York City. Contract for plazas on New York City send of Queens-Midtown tunnel, was awarded to **George J. Atwell Foundation Corp.**, of New York, for \$1,708,830. Transmission lines at Bonneville project in Oregon, went to **Fritz Ziebarth.**, of Long Beach, Calif., for \$947,726. Low bidders for two sections of Chifor \$947 726

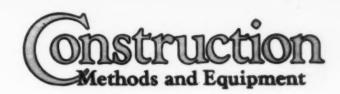
Dams & Earthwork — With price of \$5,344,605, Guy F. Atkinson Co., of San Francisco, was successful bidder for Stevens (Mud Mountain) dam at Enumclaw, Washington, Coleman Bros. Corp., of Boston, Mass., bid in for \$4,265,853 Franklin Falls dam at Franklin N. H. Dam at Knightwille. \$4,265,853 Franklin Falls dam at Franklin, N. H. Dam at Knightsville, Mass., will be built for \$1,583,445, by G. M. Brewster & Son, Inc., of Bogota, N. J. G. W. Condon Co., of Omaha, Neb., has started \$761,450 contract for Denison dam at Denison, Texas. Dredging in Tennessee River below Pickwick Landing dam, by T. V. A., will be done for \$958,479, by Al Johnson Construction Co., of Minneapolis, Minn. A Surry, N. H., A. I. Savin Construction Co., of East Hartford, Conn., will build Surry Mt. dam for \$990,160.

Section of All - American canal, Coachella branch, will be built for U. S. Bureau of Reclamation, Yuma, Ariz., by Morrison-Knudsen Co., Inc., of Los Angeles, and M. H. Hasler, of Los Angeles. In Oklahoma, Mittry Bros.

Construction Co., with price of \$2,639,870, will build Great Salt Plains reservoir. Seawall and dredging contract at Alameda, Calif., was bid in by G. Pollock Co., of Sacramento, for \$1,524,430. Great-Lakes Dredge & Dock Co., received a \$1,435,500 dredging contract

Public — Chicago Housing Authority let contract as follows, \$6,934,000 for Ida B. Wells Homes to Thompson Starrett Co., of New York City. In Atlanta, Ga., Mion Construction Co., will build Clark Howell Homes for \$2,324,900. Successful bidder for East building of Municipal Center in Washington, D. C., was D. M. W. Construction Co., of Brooklyn, N. Y., with tender of \$3,74,000. Elyton Housing project in Birmingham, Ala., will be built for \$2,911,-574,000. Elyton Housing project in Birmingham, Ala., will be built for \$2,911,000 by J. A. Jones Construction Co., of Charlotte, N. C. With bid of \$2,497,000, George A. Fuller Co., of Washington, D. C., obtained contract for Silver City housing project in New Orleans, La. A \$3,377,000 mass housing project in Charleston, Mass., went to J. Bowen, of Boston. In New York City, William Howard Taft high school will be built by Wilaka Construction Co., local contractor, for \$2,096,490. In Houston, Texas, R. F. Ball Construction Co., of Fort tractor, for \$2,096,490. In Houston, Texas, R. F. Ball Construction Co., of Fort Worth, will build Dowling housing project for \$1,148,430. Successful bidder for Orange Grove housing project in Mobile, Ala., was Algernon Blair, of Montgomery, with tender of \$909. 690. Contract for \$826,000 went to Youngstown Builders' Syndicate, of Youngstown, Ohio, for Trumbull Homes project in Warren, Ohio. Bid of \$769,900 obtained high school contract in Washington, D. C. for Jeffress-Dyer, Inc., local contractor. At Lowry Field, Colorado, Mead & Mount Construction Co., will build army barracks for \$704,430. In Macon, Ga., Oglethorpe Homes Colorado, Mead & Mount Construction
Co., will build army barracks for \$704,430. In Macon, Ga., Oglethorpe Homes
project, costing \$523,000 will be built
by R. A. Bowen Co., of Macon, Ga.,
while contract for Tindall Heights
housing project in same city went to
Central Contracting Co., of Atlanta,
Ga. Bid of \$729,700 by T. A. Loving &
Co., of Goldsboro, N. C., obtained contract for Halifax Court housing project.
Carmelitos housing project in Long Co., of Goldsboro, N. C., obtained contract for Halifax Court housing project. Carmelitos housing project in Long Beach, Calif., went to George A. Fuller Co., of Los Angeles, for \$1,723,000. In Ogden, Utah, G. A. Whitmeyer & Sons Co., will build \$803,205 city and county building. University building in Minneapolis, Minn., costing \$884,400 has been started by P. Steenberg Co., of St. Paul. In Newark, N. J., low bidder for Dreamland Park housing project was Pellecchia Construction Co., of Newark, with price of \$1,463,000. A \$1,279,000 state prison project in Green Haven, N. Y., went to A. Gallow, Inc., of New York City. At a price of \$2,487,800, McCloskey & Co., of Philadelphia, was successful bidder for general federal office building in Washington, D. C. In San Antonio, will build a low rent housing project for \$385,500.

Industrial — Among contractors for \$10,000,000 refinery for Shell Oil Co., at Roxana, Ill., are Hellrung Construction Co., of St. Louis, Mo., Austin & McKee, of Cleveland, Ohio, C. F. Braun & Co., of Los Angeles, Calif., and others. Stone & Webster Engineering Corp., of New York City, will build in Washington, D. C., a \$5,000,000 power plant for Potomac Electric Power Co. A \$3,000,000 contract for paper mill



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SEPTEMBER, 1939

ROBERT K. TOMLIN, Editor A. E. PAXTON, Manager

Editorial Staff: Vincent B. Smith. Paul Wooton (Washington). Nelle Fitzgerald

The "How" of

For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

How HOUSING FOR WORKERS on construction of Shasta dam is provided in Government camp. — p. 3 How CONSTRUCTION KIBITZERS receive deluxe accommoda tions in covered grandstand for viewing work. — p. 40 How CANTILEVER METHOD was employed to erect 300-ft. steel truss span. - p. 42
How ERECTION STAGES for building steel bridge were planned in detail. — p. 43 How EYE-BAR TOGGLES were rigged to support halves of bridge during cantilever erection. -p. 4

How FRAMING COSTS for 8-story apartment building were re How FRAMING COSTS for 5-30.7

duced by using steel-angle columns. — p. 46

How UNDER-RIVER PIPE LINES, totaling six in number, were

— p. 50 laid as unit.

— p. 50

How BIG DOUBLE-DRUM MIXER of 34E size laid 30-ft. con crete slab for three-lane highway. — p. 54
How SCREED PULLED BEHIND PAVER prepared concrete for laying steel reinforcement. — p. 54
How GASOLINE-POWERED VIBRATORS consolidated concrete around transverse paving slab joints. — p. 55
WELL POINTS furnished water for sand and gravel plant on highway job.

— p. so
TREMIE HOPPER AND PIPE delivered concrete under water for bridge piers. — p. 58
How CAISSON SHAFTS were sunk with aid of rotary cutter head on special boring machine. — p. 58
How "NO-PASSING" ZONE on highway was marked with yellow How HOMEMADE CRANE BOOM of pair of logs was rigged on 1/2-yd. power shovel. — p. 59
How BULLDOZER PUSHED GRAVEL to hopper for loading trucks. — p. 59

How REFLECTING CURB of concrete was built to insure safety for night driving. — p. 59
WINTER CONCRETING METHODS were used on five tall buildings.

How SCAFFOLD BRIDGE connected concrete hoist tower group of buildings. — p. 61
How RAPID CHARGING OF MIXER was aided by use of truck How BIG FLOATING PILEDRIVER was equipped with extensible pendulum leads. — p. 63 How ARC WELDING saved 20 per cent of weight of steel trusses for factory. — p. 64
How TRAVELING FORMS helped build stepped seawall. — p. 66

in Houston, Texas, went to Merritt-Chapman & Scott Corp., of New York City. Shell Oil Corp., has engaged C. F. Braun. of Houston, Texas, to build a \$1,000,000 plant at Harrisburg, Tex.

Commercial — In New York City. Ulen & Co., of New York, will build two 6-story apartments for \$1,765,000. Cummins Construction Co., has started a \$1,500,000 17-story hotel in Atlanta, Ga. Apartment building in Scarsdale, N. Y., costing \$1,200,000 will be con-

structed by Parkway-Spencer Corp., of Scarsdale. Hospital addition in Rochester, Minn., went to McGough Bros., of St. Paul, for \$1,000,000. In Sacramento, Calif., K. E. Parker Co., will construct, for \$1,000,000, an 11-story office and store structure. Five 2-story buildings in Flint, Mich., costing \$750,000, are under way by Wetsman Construction Co., of Detroit College auditorium at Oberlin, Ohio, went to John Gill & Son Co., of Cleveland, for \$900,000.

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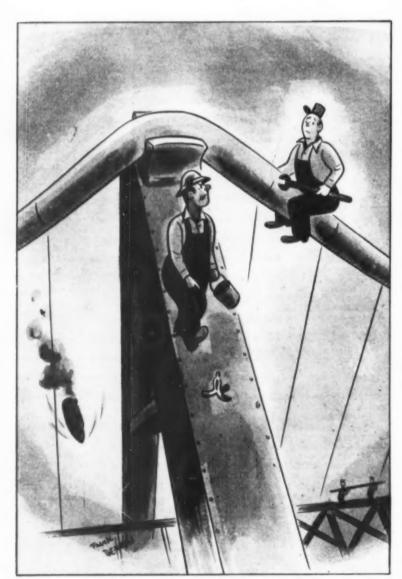
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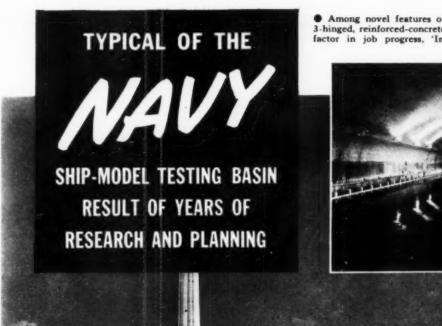
"Out'a my way, you big lug!"



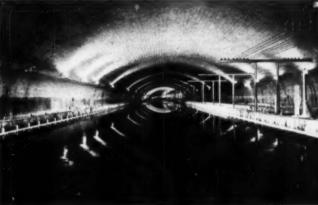
"A belluva place to leave a banana peel!"



"Stop rattling that blue print, it makes me nervous!"



Among novel features of U. S. Naval Experimental Model Basin, Carderock, Md., is 3-hinged, reinforced-concrete arch roof on 1188-ft. main section of Basin Building, Critical factor in job progress, 'Incor' was used in roof. Exterior and interior views, below.



'INCOR' USED FOR 3-HINGED ARCH ROOF

JOB COMPLETED 6 MONTHS AHEAD OF SCHEDULE; HIGH EARLY STRENGTHS EXCEEDED SPECIFICATIONS

The old saying, "count on the Navy to do things right," is concretely expressed in the new U.S. Naval Experimental Ship-Testing Basin at Carderock, Md.—Turner Construction Company, New York, General Contractor.

The entire project was conceived and executed in reinforced concrete. An outstanding feature is the three-hinged, reinforced-concrete arch roof of the Basin Building, with the hinges extending the full length of the arch.

Navy engineers envisaged the economies of high-early-strength cement in the construction of this roof, and specified accordingly. Form-stripping was permitted at a concrete strength of 3000 lb. per sq. in., but not less than 4 days.

Mix proportions were determined by test and carefully maintained throughout the job, resulting in highly uniform concrete. 'Incor' 24-Hour Cement, used in roof construction, produced average strengths of 3270 lb. per sq. in. at 3 days and 3500 lb. at 4 days.

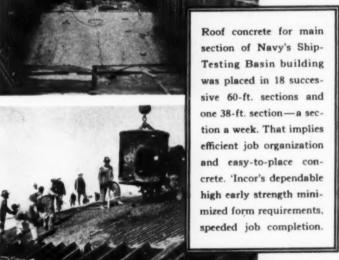
'Incor's dependable early strength exceeded specifications — and contributed toward job completion six months ahead of contract date.

About 15,000 bbl. of 'Incor' were used in the roof. In addition, close to 60,000 bbl. of Lone Star Cement were used in office, shop and laboratory buildings and in roadways. Here, too, concrete was rigidly controlled; strengths averaged 3160 lb. per sq. in. at 7 days.

A convincing example of the soundness of utilizing both Lone Star and Incor'* for maximum job economy. Write for copy of "Cutting Concrete Costs." Lone Star Cement Corporation, Room 2263, 342 Madison Avenue, New York.

*Reg. U. S. Pat. Off.

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Get in touch with your nearest International Harvester TracTracTor Dealer and let him show you how these scrapers will cut your loading time and produce more pay loads per day.

P.45

Bucyrus Erie

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There's Profit in Every Load

Dollar-saving dirt-moving performance is in full swing at Littleton, Colorado. Here five Euclids are hard at it on the George Condon Construction Company's highway job. They're hauling 3000 yards every eight hours over a mile haul road . . . another example of Euclid's performance. This is

only one of the many jobs where Euclids are producing profit dollars. On dams, reservoirs, roadwork, or wherever earth-moving is being done they're turning in daily proof of their superiority. Their speed, maneuverability, and long-life service are at work the country over. When time means money, Euclids make a saving. Find out how their "performance for profit" can "pan-out" on your job.



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The speed with which tremendous yardage must be handled in building the new 161 mile Pennsylvania Turnpike has resulted in many of the prominent contractors on the job Modernizing with Marions. Sixty per cent of all tunnel excavating is being handled by Marion excavators as well as many miles of grading and drainage. It is Marion's speed-plus proven performance that resells Marion owners time and time again - and has put nineteen Marions, mostly new ma-

chines, on the Pennsylvania Turnpike. Guthrie-Marsch-Peterson Co.

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Sideling Hill Tunnel and East

and West Approaches.

Bates & Rogers Construction Corp. 4 MARIONS Kittatinny and Blue Mt. Tunnel

and East and West Approaches.

W. H. Anderson 2 MARIONS East Approaches of Blue Mt.

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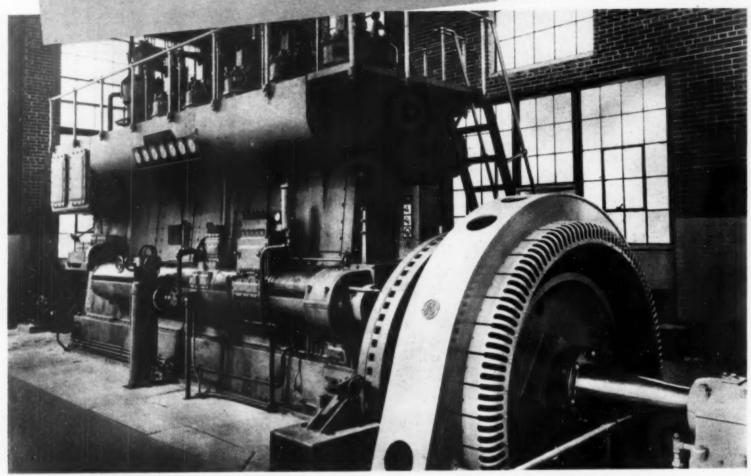
Ferguson & Edmondson

2 MARIONS New Stanton Viaduct-grading and drainage and other contract.

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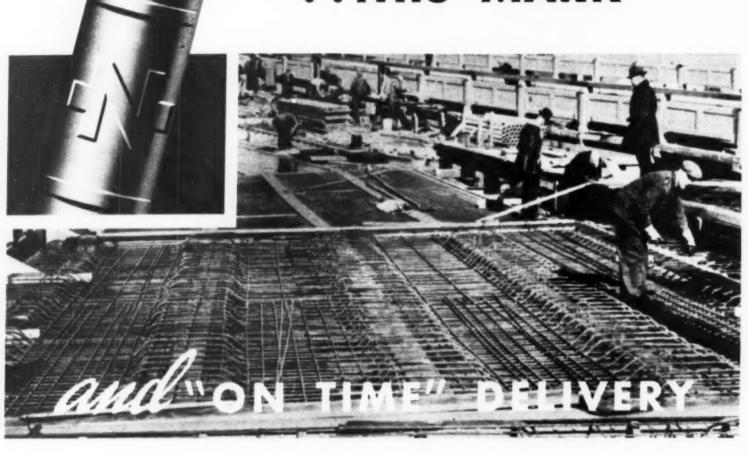
cost-per-yard excavators. See your LeTourneau and "Caterpillar" dealer now! R. G. LeTOURNEAU, INC., Peoria, Ill., Stockton, Calif.

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*Name Reg. U. S. Pat. Off.

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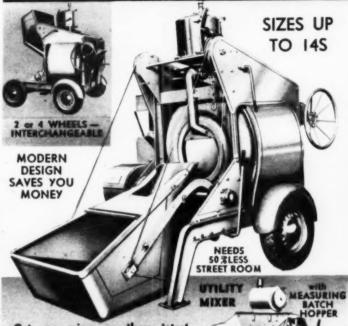
on steel products. It represents the highest quality, the finest metallurgical service."

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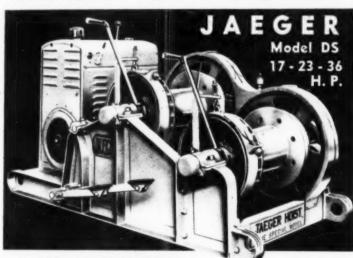


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BEST HOIST "BUY" EVER OFFERED!



A QUALITY HOIST AT A SENSATIONALLY LOW PRICE!

Other Jaeger Hoists 6 to 100 H.P. Touch control, many advanced features. Send for Catalog. Easier operating with double cone, ball-bearing screw thrust. Combined all-steel side frames and base are 50% stronger. High quality bearings, powerful brakes, balanced drums, silent chain drive. Fills real need among contractors for a quality all-purpose hoist at popular price. One or two drum... gas or electric. Get details, prices. The Jaeger Machine Co., 800 Dublin Ave., Columbus, Ohio.

Built by JAEGER



JAEGER, ALONE, Gives You All These Pumping Features



Only \$85 f.o.b. Factory—3000 Gallon Bantam Weighs But 52 Lbs. JAEGER "PRIMING JET" — Up to 5 times faster priming and re-priming — often means difference between profit and loss on job. No adjustments — no need to "gun" engine.

POSITIVE RECIRCULATION CUT-OFF

— It's controlled by flow, not pressure.

"FULL-RANGE" IMPELLER gives high efficiency under all conditions (built of steel in 4" to 8" sizes).

ACCESSIBLE SEAL — always outlasts the impeller.

PATENTED SELF-CLEANING SHELL — scours while pumping, won't clog, easily accessible.

DEPENDABLE, LONG LIFE CONSTRUCTION — means thousands of EXTRA hours of service.

EVERY PUMP INDIVIDUALLY TESTED for capacity and pressure before it leaves our factory.



Send for Prices and New Catalog Describing Complete Line of World's Champion Sure Prime Pumps:

Compact 2", 3", 4" and 6" Sizes—Heavy Duty and Intermediate Types.

8" and 10" Sizes, Most Portable Big Pumps on Market — Capacities to 220,000 G.P.H.

Convertible Jetting-Dewatering Pumps (Two Pumps in One).

Vertical Caisson Pumps Well Point Systems Triplex Road Pumps.

THE JAEGER MACHINE CO.

HORSE-POWER

TO MATCH
EVERY JOB!

On any job—big or small—you can take advantage of the fuel-economy . . . dependability . . . and low maintenance-cost of a "Caterpillar" Diesel! Because these tractors are built in five different sizes—offering a range of drawbar-horsepower calculated to meet every need of today's construction work.

Choose the size that fits your job. Whether it's the big D8 or the little D2, you get the same

assurance of traction to conquer sand, rock, soft soil and bad grades—traction and power to take loads where you want them to go. And sturdiness and precision construction to keep maintenance-costs low. And fuel-economy that helps earn extra profits. See your nearest dealer, or write direct for more information on these five "Caterpillar" Diesel sizes.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

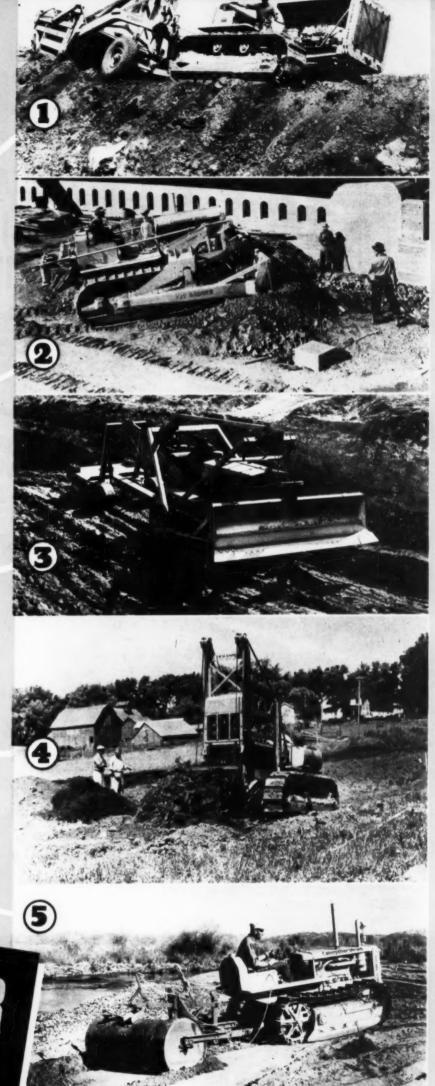
The biggest of all "Caterpillar" Diesel Tractors—the D8. This model delivers 97 horsepower at the drawbar! The particular one shown here is owned by A. B. Lynch, Milwaukee, Wisconsin. Moving big loads of clay and rock, with a Le Tourneau Carryall scraper. It makes a round trip every 6½ minutes on a 500-foot haul, using only 5 2/5 gallons of low-cost fuel an hour!

The second largest "Caterpillar" Diesel Tractor—the D7. This machine delivers 69 horsepower at the drawbarl Tom H. Walsh, Temple, California, owns the one in the photograph. Equipped with a bulldozer, it is backfilling a retaining wall on the Los Angeles Union Railway Terminal.

The "Caterpillar" Diesel D6 Tractor—third from top in horsepower. It delivers 45 drawbar-horsepower! (There is also a gasoline model, the R5.) Equipped with a bulldozer and ripper, this machine is working on the relocation of a highway near Cornville, Arizona.

"Caterpillar" Diesel D4 Tractor with a Trackson high shovel. This size delivers 35 horsepower at the drawbar! (There is also a gasoline model, the R4.) Owned by Breeden Bros. Construction Co., Fulton, Illinois, the D4 in the picture uses only 1½ gallons of 8½-cent fuel an hour. In three days, it loaded out 959 cubic yards of rock and compacted street. In two days, it took the overburden off gravel and loaded 300 yards of gravel. A bulldozer can be attached to this outfit in a few minutes. It is a hauling unit too. Its shovel-work includes excavating, ditching and filling—one of the most versatile machines you'll ever see!

The smallest "Caterpillar" Diesel Tractor—the D2—which delivers 25 horsepower at the drawbar. (Gasoline model is the R2.) The machine shown at work with a Killefer rollover scraper on a 100-yard haul is owned by F. W. Stodieck, Minden, Nevada. It uses about 8 cents' worth of fuel an hour! Speaking of this machine, Mr. Stodieck says: "We like the 5 forward speeds because we can handle a wide range of work—plenty of speed on lighter jobs."



CATERPILLAR
DIESEL ENGINES
TRACK-TYPE TRACTORS
ROAD MACHINERY



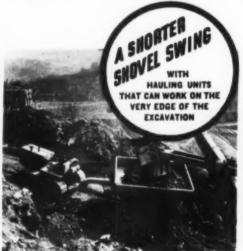
RROFITABLE SPEED

IN HAULING STARTS WITH HAULING UNITS THAT ALLOW MAXIMUM LOADER OUTPUT

THE shorter the shovel swing, the greater the output! But to get a shorter shovel swing, you need hauling units with big, wide bodies—low loading height—that can get close to the digging. These pictures tell you why—and cold, hard

figures back up the story! For greater profit on your jobs, get complete information—write today for the book, "Speed in Hauling," which tells the complete story of consistent speed and profit with Athey Forged-Trak Hauling Units pulled by "Caterpillar" Diesel Tractors.











See Your
"CATERPILLAR" DEALER
For Information Concerning the Effect of Shovel
Swing on Output, and Send
Today for This Free Book

ATHEY TRUSS WHEEL CO.
5631 W. 65th STREET, CHICAGO, ILLINOIS
Cable Address: "Trusswheel", Chicago

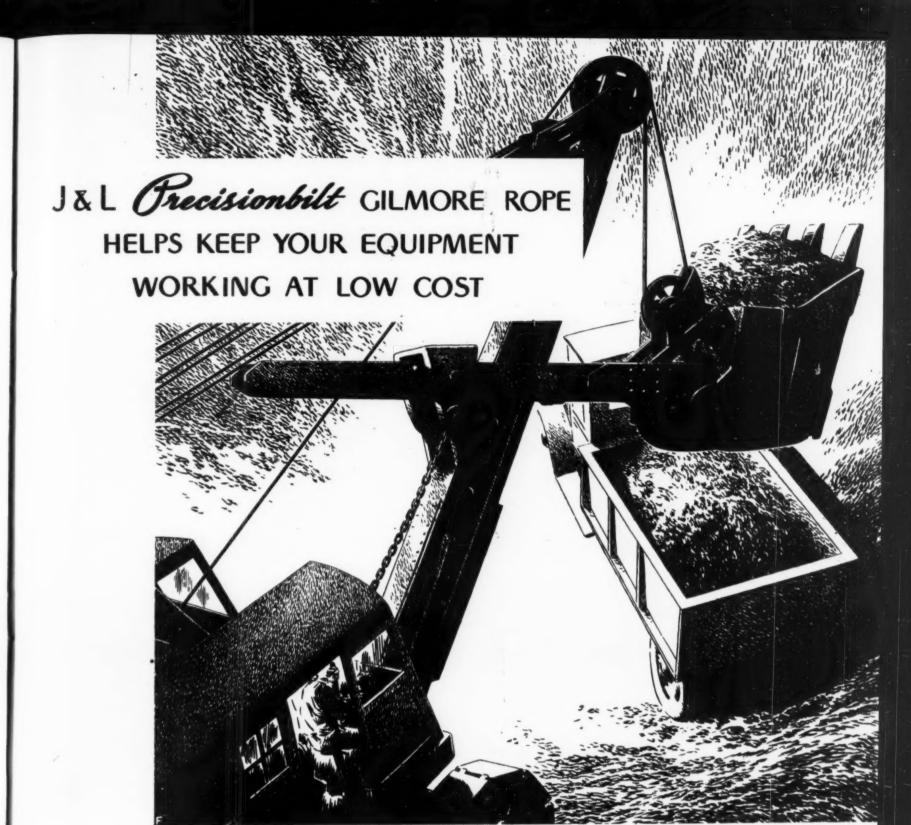
ATHEY
FORGED-TRAK
WAGONS AND TRAILERS



ATHEY TRUSS WHEEL CO. 5631 W. 65th St., Chicago, Illinois

Gentlemen: Please send me my copy of your free book, "Speed in Hauling."

Name....



You can depend on J&L Gilmore Wire Rope to help keep your shovels, buckets, drags and other equipment working efficiently, because it has the strength, flexibility and abrasion-resistance to stand up under hard, continuous service.

Precision bilt Gilmore Rope is made exclusively of J&L Controlled Quality Steel — on the world's newest wire rope making machines, which work to a tolerance of 1–1000 of an inch.

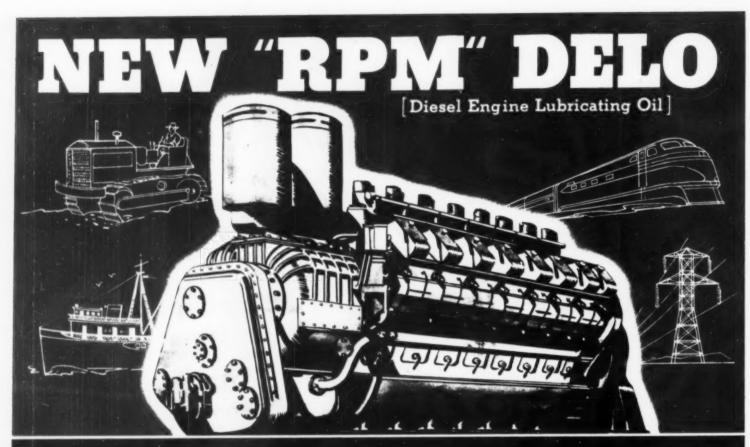
When any of your earth-moving or material-handling equipment needs wire rope — or when you order new equipment — specify J & L Precisionbilt, the rope you can depend on for safety and economy. Write today for your copy of our catalog on J & L Precisionbilt Gilmore Wire Ropes.

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS
GILMORE WIRE ROPE DIVISION
PITTSBURGH, PENNSYLVANIA



J&L-PARTNER IN PROGRESS TO AMERICAN INDUSTRY



Pushes Diesel performance UP Pushes Diesel costs DOWN

We know that NEW "RPM" DELO means unequaled lubrication for all Diesel engines regardless of size, speed or type of bearings—and its day-in, day-out performance in commercial operation backs us up.

It has traveled twice the distance 'round the world in 73 days on a milea-minute schedule—run thousands of hours in stationary Diesels at full brake borsepower—worked 24-hour shifts in automotive equipment, and marine engines, too.

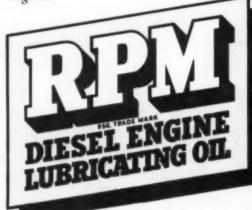
The results? Ring sticking ended! Carbon, sludge and other deposits from previously-used oils cleaned out in engine after engine! Alloy-bearings free from corrosion! Oil filters clean! Pistons, rings, cylinders, bearing surfaces in new engines broken in to supersmooth finish! AND—

Not only has NEW "RPM" DELO pushed wear rate way down - it has

New "RPM" Diesel Engine Lubricating Oil now available everywhere in the gray barrel with the blue head also reduced fuel consumption and exhaust temperatures materially. Better engine operation! Lower costs!

Take a tip from these actual service results confirming our 10 years — 10,000,000 miles of testing —

NEW "RPM" DELO is today's unequaled lubrication buy for your Diesel engines.



Order from Your Nearest Distributor as Listed Below:

IN THE UNITED STATES

"RPM" Diesel Engine Lubricating Oil:

The California Company (Montana only)
Humble Oil & Refining Company
Standard Oil Company (Indiana)
Standard Oil Company (Nebraska)
Standard Oil Company of California
Standard Oil Company of Texas
Utah Oil Refining Company

Diol "RPM" Diesel Engine Lubricating Oil: The Carter Oil Company, Tulsa, Oklahoma Colonial Beacon Oil Company Standard Oil Company of Louisiana Standard Oil Company of New Jersey Standard Oil Company of Pennsylvania

Kyso "RPM" Diesel Engine Lubricating Oil: Standard Oil Company (Inc. in Kentucky)

Signal "RPM" Diesel Engine Lubricating Oil: Signal Oil Company

Sohio "RPM" Diesel Engine Lubricating Oil: The Standard Oil Company (Ohio) IN CANADA AND NEWFOUNDLAND

New Imperial "RPM" Diesel Engine Lubricating Oil: Imperial Oil Limited

IN BRITISH COLUMBIA, ALBERTA AND SASKATCHEWAN

New "RPM" Diesel Engine Lubricating Oil: Standard Oil Company of British Columbia Limited

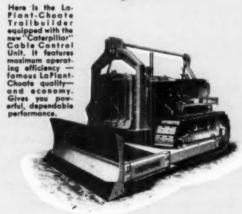
THROUGHOUT THE WORLD

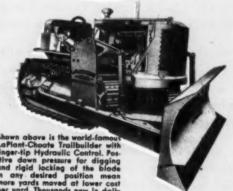
"RPM" Diesel Engine Lubricating Oil is available through distributors in more than 100 countries.

STANDARD OIL COMPANY OF CALIFORNIA



World-Wide Favorites!





Your Choice of Hydraulic or "Caterpillar" Cable Controls

"Work complete on schedule and within the budget"- It's a real boost for you to report a finish like that consistently on job after job! And here are some of the basic reasons why LaPlant-Choate Trailbuilders help you gain new prestige... save time . . . cut costs!

Economical! - LaPlant-Choate Trailbuilders are fast, easy to operate, built to slash maintenance costs and enable you to keep your men, trucks and other equipment profitably busy.

Versatile! - LaPlant-Choate Trailbuilders build, level and grade roads; remove rocks, stumps and trees; dig drainage ditches; terrace side hills; crown roads; widen shoulders and do scores of other profitable jobs. The Trailbuilder assembly is easy to mount - easy to take off.

Dependable! - Built for use exclusively on "Caterpillar" Tracktype Tractors assuring a well-balanced, highly coordinated unit singularly free from breakdowns and expensive delays. Sold and serviced exclusively by "Caterpillar" dealers — thus giving you readily available, competent service facilities.

Right now is the time to modernize your equipment with one or more LaPlant-Choate Trailbuilders. Let your LaPlant-Choate and "Caterpillar" dealer show you in detail how they save you time, money and trouble. Write today for Free catalogues.

SNOW PLOWS TAMPING ROLLERS TREEDOZERS

PLANT-CHOATE

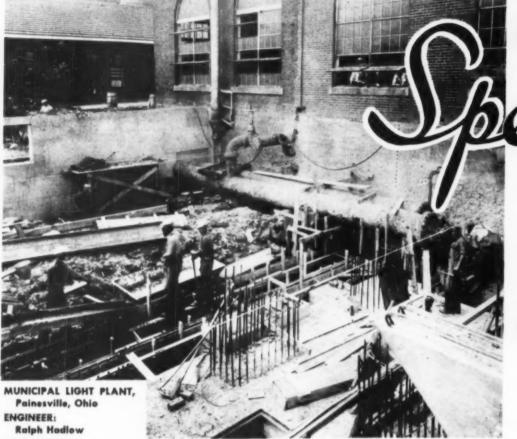
BULLDOZERS BRUSH CUTTERS RUBBER WHEEL WAGONS CARRIMOR SCRAPERS

CEDAR RAPIDS. IOWA.

luick curing to resist water pressure in early stages

Dense concrete to resist water penetration

uick service strength to speed up construction



CONTRACTOR:





Too often when comparing Lehigh Early Strength Cement with normal portland cement the advantages

are measured only in terms of cost savings and quicker job completion. That there are other factors to consider was demonstrated in the Painesville Light Plant where foundations extended nine feet below water level.

The engineer's concrete specification called for:-quick curing in the early stages because of heavy water pressure-maximum density for permanent watertightness-quick service strength so that further construction could proceed promptly. The Quick Service Quality Concrete to meet the job conditions was made with Lehigh Early Strength Cement.

Lehigh Early Strength Cement hydrates 3 to 5 times faster than normal portland cement. The cement paste more effectively coats the aggregates and fills the voids. It makes a workable plastic mass for easy placing. Maximum watertightness is obtained. The concrete cures to service strength in one-third to one-fifth the usual time.

Lehigh Early Strength Cement is profitably used by contractors everywhere-to make quality concrete-to reduce costs by speeding up the job—to save on forms through quick removal and re-use—and to reduce the hazard of freezing in cold weather.

Apply these advantages to your concrete work. The Lehigh Service Department will gladly answer questions.

ORTLAND COMPANY CEMENT

Allentown, Pa.

Chicago, Ill.

Spokane, Wash.

RALPH MYERS

GENERAL CONTRACTOR DAMS - HIGHWAYS - RAILROADS

HOME OFFICE SALEM, INDIANA

FIELD OFFICE

The Thew Shovel Company Lorain, Ohio

Salam, Indiana July 10, 1939

EXPERIENCE

YARDAGE

SATISFACTION

Gentlemen:

We have had an opportunity to test the marits of our new #87 Lorain in hard rock, shale and earth and find that this machine is the same rugged type shovel with the same sturdy characteristics as have always been built into Thew products, and which we have learned to expect of them through experience with 5 Lorains purchased during the past 8 years.

We have not had an opportunity to check yardage moved accurately but we are getting an average of at least 150 yards per hour in rock and 250 yards per hour in dirt.

Maintenance on the rig to date has been very low and from all outward appearances we can expect it to be low during its useful life.

We are running two seven hour shifts and both operators seem very well pleased with the ease with which the machine handles.

To date we can only say good words for our Lorain #67.

Very truly yours,

Ralph Myer

RM/eg



COULD YOU USE A SAVING OF 10% TO 20% IN FLEET COSTS?

F. W. STRECKER TRANS. CO. IS SAVING 16.5% . . .



motive Engineer, St. Louis, explains inspection and cost record to F. W. Strecker, Jr., operator of the F. W. Strecker Transfer Company, St. Louis.

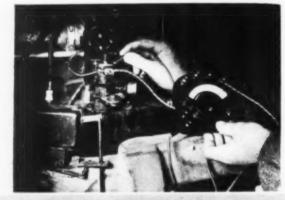
Savings as high as 22.5% were made on some of the heavy freight haulage trucks in the F. W. Strecker Transfer Company fleet, St. Louis, Mo. The average for the fleet was 16.5% which is not an unusual record for Standard Automotive Engineering Service

There are so many ways that one of these Engineers can help shop men. The modern, scientific instruments for motor analysis with which each engineer is equipped enable him to make an accurate check of fleet efficiency. These engineers are also thoroughly familiar with up-to-date fleet maintenance and cost record systems. The installation of cost records was an important factor in the saving that was made on the F. W. Strecker fleet.

Smoke and odor trouble, oil sludging, and vapor lock are some of the problems these engineers have helped solve in all types of fleets.

Testing for voltage drop in distributor wiring with a voltmeter, one of the many instrumen with which Standard Automotive Engineers are equipped to enable them to make an accurate analysis of fleet conditions.







W. H. McConighen, Automotive Engineer, Milwaukee, Wisconsin, checking custom construction equipment. Such tests, made periodically, keep fleets using Standard Automotive Engineering Service operating at peak efficiency

CONTRACTOR'S FLEET PICKS UP 18% IN EFFICIENCY

Overall efficiency of fleet engines is the first concern of a Standard Automotive Engineer when he goes to work on your fleet. When engines are operating at peak performance, gasoline consumption is bound to drop. And that isn't all; maintenance costs drop too. But there is no sacrifice in engine power to get these economies when a Standard Automotive Engineer is on the job.

This service recently made an average increase of 18% in combustion efficiency in a Wisconsin road contractor's fleet. That meant not only a substantial reduction in gasoline consumption, but more power in each tractor, truck, and shovel in the fleet, and fewer delays for repairs on the job.

Find out how Standard's Automotive Engineering Service differs from any fleet checking service you have tried. One of these Engineers will be glad to tell you just what he does. You can reach him through your local Standard Oil (Indiana) office.

RAISES BUS FLEET MILEAGE 16%

Gasoline mileage was increased as much as a mile per gallon on some units in an Illinois city bus fleet. The average increase for this fleet of 50 buses was over 3/4 mile per gallon.

That saving was made when this fleet operator changed to Standard Red Crown gasoline and a Standard Automotive Engineer helped him take full advantage of Red Crown economy.

Trouble from gummed carburetors and fouled spark plugs was also a problem before the engineer and Red Crown took over. "We used about a peck of plugs a week," said the general manager. "Now it's unusual to change more than three or four a month.'

Remember, these savings and the Engineering Service reported in all these instances did not cost these fleet operators a cent. The only requirement is that you operate in the 13 Midwestern states served by these engineers. Write Standard Oil (Indiana), 910 S. Michigan Avenue, Chicago, Illinois, for the engineer in your territory

STANDARD OIL COMPANY (INDIAN.

AUTOMOTIVE ENGINEERING SERVICE LOWERS MILEAGE MILEAGE

NEVER BEFORE!

OF THESE FEATURES

Never before has there been a self-priming pump that could give you the honest to goodness, down-right value and the many features found in the Novo Model "K" Self Priming Centrifugal Pumps.

EAST PRIMING that is as sure as an old triend for there is nothing to prevent priming if your suction line is tight, and that's priming performance that will last through years of operation

VOLUME that meets with ease all of the standards set up by the Associated General Contractors of America, Inc., for every size pump. Here is your protection against wild claims for pump volume and operation. The contractors, themselves rated our pumps.

WEAR PLATES. Where extreme wear has occurred, it is a very simple matter to compensate by the removable and adjustable wear plates that are installed on both sides of the impeller.

> ACCESSIBILITY. These pumps are almost as accessible as your old coat pockets. You can remove the impeller-by just taking off the outer pump plate. None of that clumsy, time-consuming dismantling of the pump or removing the power unit from outfit to get at the impeller.

> > RELIABLE VALVES. The check valve is not at the usual rubber but is made of Neoprene that scientific development that has twice the wear-resisting qualities of rubber and has many times more resistance to oxidation. Neoprene resists chemical and oil deteriorating action.

> > > LOOKS. Novos have the smoothest, neatest lines of any self-priming pumps. Their appearance is a credit to any man's job for they reflect sound engineering judgment and the progressive trend of smooth design.

> > > > GUARANTEED to meet the A. G. C. standards for self-priming pumps, size for size and in every respect - standards set up by the country's leadprogressive contractors.

Novo 11/2", 3,000 GPH Pump. Weighs 70 lbs.

Right now is the time to start enjoying the savings you make by using Novo Pumps. Be fair with yourself and take advantage of all their super features that no other pump can give you.

A complete line of Self-Priming Centrifugal Pumps straight through from the light-weight, 3M or 11/2"-3,000 GPH Pump to the giant capacity, heavy-duty 8"-125,000 GPH Pump. All can be furnished gasoline or electric powered or less power. -

Mountings are available to suit any job-pneumatic or steel wheels, carrying handles, skids, etc. SEE THEM ALL IN THE NEW BULLETIN NO. 175, FREE ON REQUEST.

ENGINE COMPANY LANSING, MICHIGAN

Mail this coupon today!

Send new Bulletin No. 175 on complete line of Novo Self-Priming Centrifugal Pumps with A G C performance tables.

NOVO ENGINE CO., 200 Porter St., Lansing, Michigan.

NAME

THESE PUMPS COMPLY WITH A. G. C. STANDARDS.

ADDRESS

CITY..... STATE....

Safety is ALWAYS the first consideration

Wherever explosives are used, the most important thing is safety—first, last, and always. With Atlas Manasite Detonators, considerations of safety become—not less important, but more effective.

Through materially reduced sensitivity to impact and friction, Atlas Manasite Detonators lessen the possibility of accidents from inadvertent mishandling. Reports from the field show that Atlas Manasite Detonators have resisted accidental firing in many cases where other types of caps might be expected to detonate.

Atlas Manasite Detonators provide greater assurance of safety—with no loss in detonating efficiency—and no increase in price!



ATLAS ATONIA DETON

ATLAS POWDER COMPANY, WILMINGTON, DEL.

Cable Address-Atpowco

Everything for Blasting OFFICES

Alientown, Pa. Boston, Massa Butte, Mont. Chicago, Ill. Denver, Colo. Houghton, Mich. Joplin, Mo. Knoxville, Tenn. Los Angeles, Calif. Memphis, Tenn. New Orleans, La. New York, N. Y. Philadelphia, Pa. Picher, Okla. Pittsburg, Kansas

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ATLAS

EXPLOSIVES



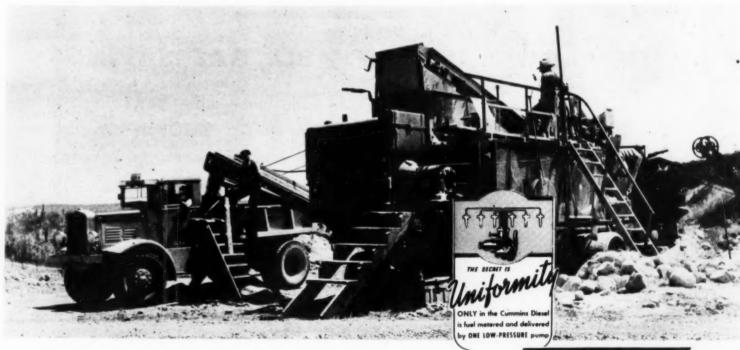
Saves

In 1936, Columbia County, Wisconsin, repowered a portable rock crusher, with a Cummins Diesel, replacing a gasoline engine. In two years' time the Cummins Diesel showed a saving in operating costs of \$2300 over the former gas engine. The gas engine had used 9 to 10 gallons of fuel per hour and the Cummins Diesel cut this to 4 to 5 gallons an hour.

The Cummins Diesel also slashed maintenance costs. It received its first overhaul in 1939 and the cost of this overhaul was only half the cost of overhauling the former gas engine.

Columbia County is taking full advantage of this economical, dependable Cummins Diesel power. They just purchased another Cummins Diesel to power a second rock crusher and a Cummins Diesel-powered Northwest Shovel.

Your Cummins dealer will be glad to tell you how you, also, can crush rock for rock-bottom prices. Cummins Engine Company, 1716 Wilson Street, Columbus, Indiana.



Columbia County, Wis., repowered this portable rock crusher with a Cummins Diesel, Model HP-601 (100 hp. at 1500 rpms.), and in two years saved \$2300 in operating costs. Production varies between 50 and 65 yards per hour, depending on pit.

CUMMINS Diependable DIESELS



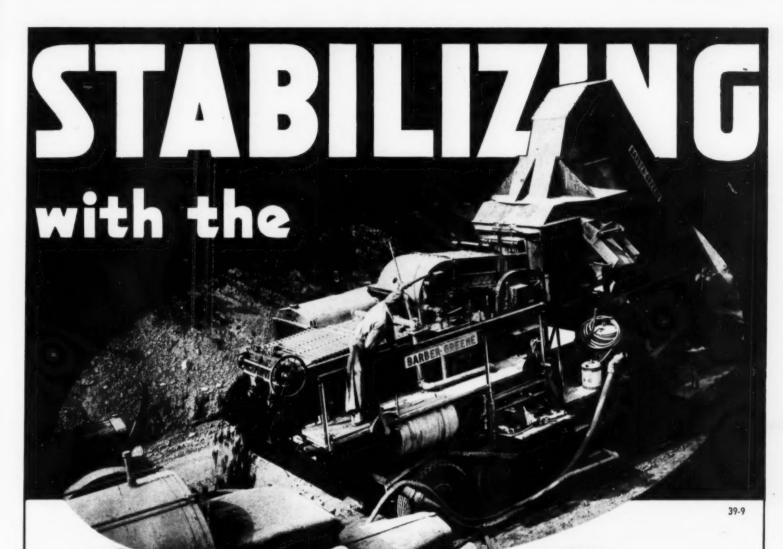
WITH ALMOST UNBELIEVABLE GAS SAVINGS

Give a GMC the heavy jobs always. A GMC has more power—more than all other trucks in any given capacity. And a GMC gives record-low gas savings! GMCs are America's most stalwart dump trucks, especially. Broad-backed, strong, powerful and miserly on gas, particularly with forced engine idling, they stand alone for all-round efficiency in this class of service. Important, too, GMC prices begin down with the very lowest!

Our own YMAC Time Payment Plan assures you of lowest available rates

CHECK GMC PRICES Against the 3 Lowest!

GMC TRUCKS TRAILERS - DIESELS



Barber-Greene Mixer

ECONOMY is the chief reason for stabilization, which means utilizing materials already on the road. This in turn dictates a road mix method. The history of stabilization has proven that there must be complete control—accurate proportioning of the soil and stabilizing agent, thorough mixing, absolutely consistent and controlled treatment. Weather hazards require that the mixing be done in one windrow, in one pass, and this combined with the usual large cross section means a large volume per running foot.

High capacity, accurate proportioning, thorough mixing are simply the fundamentals of the Barber-Greene Travel Plant. That's why it has been identified with the most successful stabilization jobs in the country. It is the answer on all types of stabilization work. It is also the ideal "black top" Mixer, and is equally superior in either Travel or Central Plant Set-Ups.



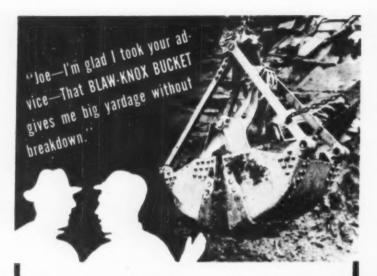
The Barber-Greene Mixer shown in these two photographs is climbing an 11% grade while mixing 2 yards a minute on a tar stabilization job in West Virginia. On this 9 mile job, the Barber-Greene also did cut-back asphalt and emulsion stabilization. Many more interesting jobs are described and illustrated in our Mixer Booklet. Send for your copy, there is no obligation. Barber-Greene Company, Aurora, Illinois.

BARBER



GREENE

ILLINOIS



 Contractors know that the proper use of modern steels and alloys at critical points is their assurance of long uninterrupted service when they buy a Blaw-Knox Bucket.

If you aim to increase yardage and efficiency, to reduce maintenance costs and prolong the life of your buckets—investigate Blaw-Knox Buckets for all kinds of digging and rehandling Send for Blaw-Knox Bulletin No. 1561.

BLAW-KNOX DIVISION of Blaw-Knox Company PARMER'S BANK BUILDING PITTSBURGH, PENNA.

l'Mires and Representatives in Principal Cities

BLAW-KNOX Clamshell BUCKETS





Blaw-Knox is the only manufacturer offering complete equipment for ready mixed concrete; including Trukmixers and Agitators, Ready Mixed Concrete Plants and Truck Mixer Loading Plants of all capacities and types.

Send for Blaw-Knox Catalogs Nos. 1566 and 1582.

BLAW-KNOX DIVISION of Blaw-Knox Company SARMER'S BANK BUILDING PITTSBURGH, PA.

BLAW-KNOX Truck Mixer



Blaw-Knox BULK CEMENT PLANTS are the ultimate in portability, speed, and convenience of use and operation. They are complete units for unloading, storage, batching and handling of bulk cement—dependable and accurate.

Completely described in Blaw-Knox Catalog No. 1566. Send for copy.

BLAW-KNOX Bulk Cement Plants

DIGGING VALUE counts in getting out PAY DIRT

Before putting a shovel on your job you can figure its digging value as measured in terms of pay dirt. Your past experience will tell you the many operating advantages of one-piece heavy duty chain crowd in providing wider shovel working ranges • Unit-cast alloy steel bases to withstand shock and vibration • Long, wide crawlers to give added stability • "E-Z" touch control, booster power clutches to avoid operator fatigue. These are only a few of the many standard features found in all BAY CITY machines at no extra cost. They are described and illustrated in Catalog H-2 — Write for your copy.

BAY CITY SHOVELS, Inc., BAY CITY, MICHIGAN Export Office: H. M. Hein, 330 W. 42nd St., New York, U.S.A. (Opare)



Dirt flies when the speed, power and ease of operation of this Model 32 Trench-hoe starts up on new development at Hasbrook Heights, where Benedetto Constr. Co., Inc., Palisades Park, N. J., are doing some interesting work.

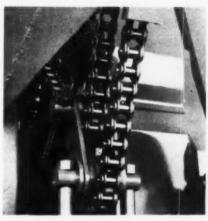


One-piece unit-cast alloy steel car body and revolving table withstands shock and vibration successfully.

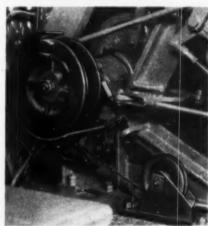
Helical gears give smoother, quieter operation and greater tooth contact affording longer wear.

Anti-friction bearings, even to boom point sheave, for low cost, efficient operation.

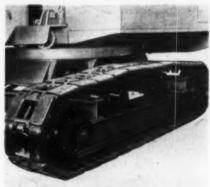
No stopping to shift — Fast, easy travel and steering under full power in either direction by simply applying pressure on cone clutches which operate brakes.



Wider working ranges, with bigger yardage result from this powerful one-piece crowd chain and it reduces maintenance costs.



Speed up shovel operation with this Electric Dipper Trip which adds 10 to 25% to daily yardage—there's no extra charge.



These standard long, wide crawlers with drop-forged shoes provide low ground pressures and added stability in heavy digging

BAY CITY SHOVELS



"All our Diesel Equipment Performs Better

with GULFPRIDE OIL" ... says this contractor

"Stays on the job 24 hours a day with Gulf's

Higher Quality Lubricants and Fuel"....

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provide an extra margin of operating safety, insuring full protection against engine troubles which might result from improper lubrication.

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GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.



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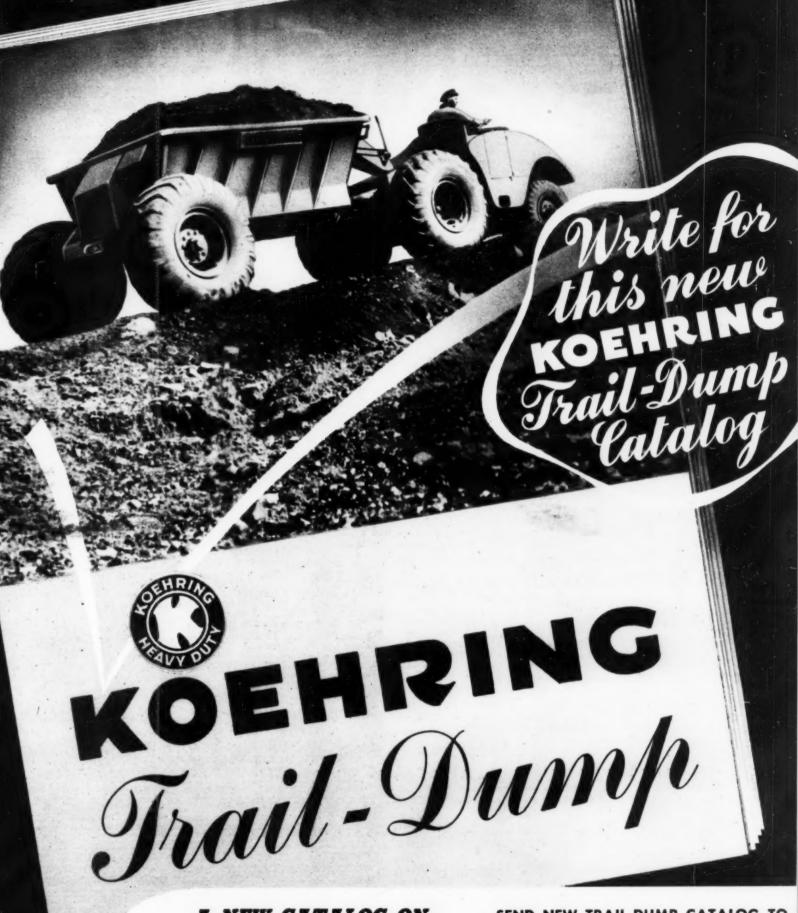
SAVE MONFY

Actual photograph of a Gulf engineer consulting with one of the operating men on this big job regarding the lubrication requirements on a Diesel shovel. His recommendations are backed by a highly specialized knowledge gained through many years of training and experience in the field.



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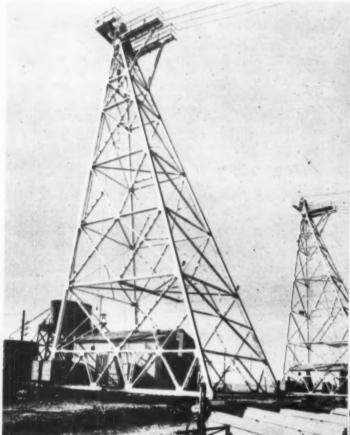
CITY

STATE

HEAVY-DUTY CONSTRUCTION EQUIPMENT

"G-E CONTROLS Permit a

Says Contractor at Conchas Dam



Read What He Says about the "Fast Getaway" and "Ease of Manipulation" of G-E Cableway Controls

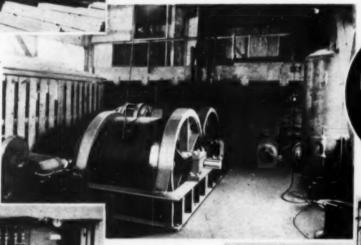
"THE General Electric magnetic controls on our Conchas Dam cableways have been a source of great satisfaction," says Mr. Stanley Bent, President of Bent Brothers, Inc., and Project Manager for Bent Brothers, Inc. and Griffith Company, of Los Angeles. "They permit doing a maximum of work every day because they have both the fast getaway needed for light loads and the accurate jogging needed for heavy tonnage. Their ease of manipulation has been very pleasing to our operators."

Not only the G-E control, but all the other G-E equipment at Conchas Dam is helping to make possible "a maximum of work every day." Some examples of this G-E equipment are shown in the pictures on these two pages.

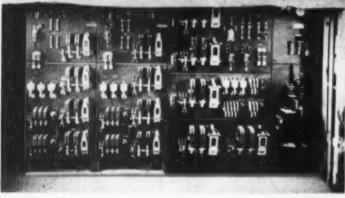
The increased ease and safety of electrical operation speeds up many types of construction jobs—brings contractors bigger net returns. Check with the nearest G-E office when you plan your next job. There are G-E sales engineers in 103 cities. If you haven't the address of the one nearest you, write to General Electric, Schenectady, N. Y.

Headtowers for the G-E equipped Lidgerwood cableway are propelled along a 450-ft curved track by G-E gear motors. Each tower supports a 1650-ft span that carries a full bucket of 21,000 lb

A 250-hp G-E motor drives the hoist and travel drums in each of the headtowers. Note the operator, equipped with headphones, who controls the bucket from signals



YOU CLEAR A
BIGGER NET
WHEN YOU OPERATE
ELECTRICALLY

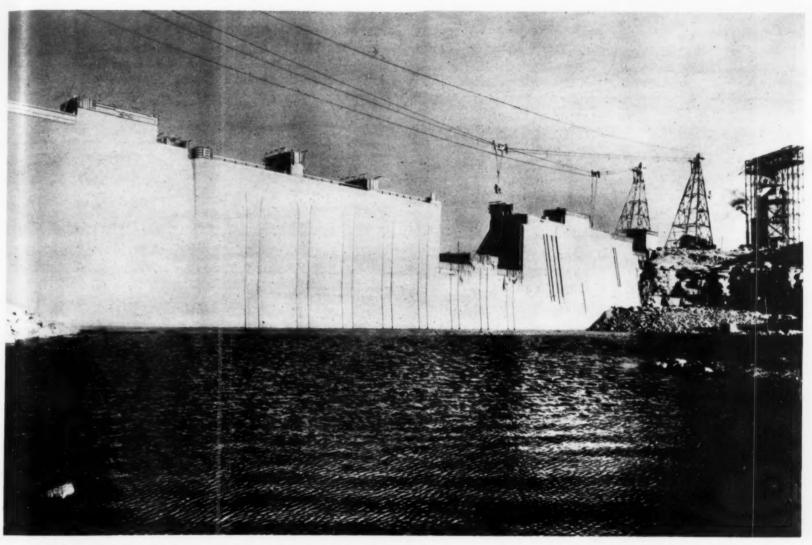


G-E control panel. This is one of the two control panels in the cableway headtowers that have won the favor of operators by their flexible and easy operation, as told in the text above



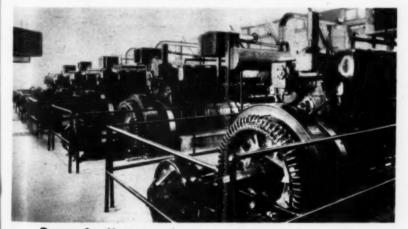
Concrete-mixing plant has two 4-cu-yd mixers, driven by G-E motors. The framework over the aggregate bins is the end tower of the aggregate tramway

Maximum of Work Every Day"

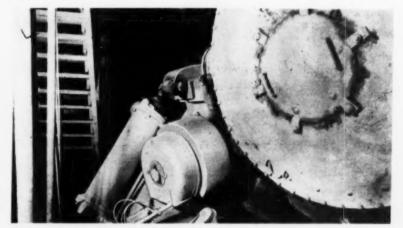


Conchas Dam, upstream side, as it rises out of the South Canadian River in New Mexico. The main dam will be a concrete gravity structure, 235 ft high and 1,250 ft long. The project also requires 13,650 linear ft of wing dams and dikes, which will be composed of earth

embankments. Contract for the main dam and part of the wing dams was let to Bent Brothers, Inc. and Griffith Company, of Los Angeles. Headtowers for the G-E equipped cableway are shown on the land at the right.



Power for the project and for service purposes comes from these six G-E 356-kva generators driven by natural-gas engines



Closeup of G-E 75-hp squirrel-cage induction motor driving one of the concrete mixers (shown in mixing position)

GENERAL & ELECTRIC



ever replace a shoe on P&H's tractor-type crawlers. Their cost is but a small fraction of that of ordinary traction treads and you save dollars in replacing time. By removing four bolts you can lift out the P&H shoe without disturbing the crawler track. In addition the P&H tractor-type crawler gives you a smoother, surer, means of travel. Why not learn all about these modern P&H Pacemakers that are "5 years ahead of the field?"



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OINSTITUCTION Methods and Equipment

ROBERT K. TOMLIN, Editor

Volume 21

September, 1939

Number 9

HOUSING

For Construction Workers At Shasta Dam

DORMITORIES FOR SINGLE MEN (below) employed by U.S. Bureau of Reclamation include two air-cooled structures, each with 34 bedrooms, at Toyon, Calif., 3 mi. east of damsite.



U. S. Bureau of Reclamation Photo

ADMINISTRATION BUILDING at Shasta dam houses offices of U. S. Bureau of Reclamation engineers headed by Ralph Lowry, construction engineer in general charge of the project.



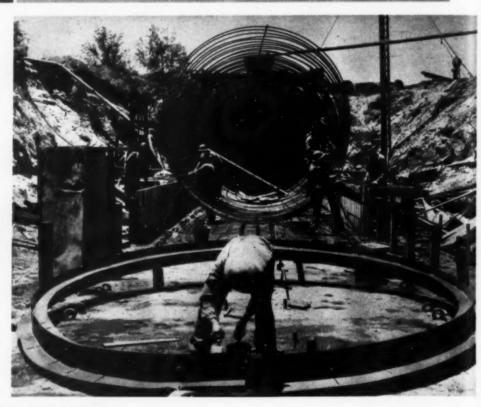
GOVERNMENT CAMP at Toyon, Calif., with present population of 400, is being enlarged by building of 18 additional duplex cottages to accommodate 36 more families of Bureau of Reclamation engineers, clerks, inspectors and surveyors.



cLosure of cantilever span No. 3 of Mississippi River bridge at Baton Rouge, La., is made at mid-channel by Bethlehem Steel Co. for Louisiana Highway Commission. View is from southeast, showing pier No. 3 in foreground and pier No. 4 at left. Combined highway and railway structure, with approaches, will cost \$8,361,000 and have total length of 2½ mi. River crossing is five-span continuous truss 3,326 ft. long, with two cantilever spans each 848 ft. in length, a 650-ft. central anchor span and two 490-ft. shore anchor spans. — Photo from N. E. LANT, bridge engineer, Louisiana Highway Commission.

LAST LINK (right) in 242-mi, main line of Colorado River aqueduct in California nears completion as construction crew of Metropolitan Water District, under direction of B. C. ("Mike") Leadbetter, general superintendent, places reinforcing steel and concrete in 752-ft long section of Casa Loma siphon, 12 ft. 4-indiameter conduit connecting with west portal of San Jacinto tunnel. Construction work on the aqueduct, which will serve 13 cities in Southern California, was started in December, 1932. Since that time more than 32,000 men have been employed on the job financed by a \$220,000,000 bond issue.

FOR CONSTRUCTION KIBITZERS (below) checking up on operations of the Turner Construction Co., which is building a new home office for the New England Mutual Life Insurance Co. in Boston, Mass., de luxe accommodations are provided in the form of a screened grandstand, with tiers of seats protected from the sun by a striped canvas roof. These "ringside" accommodations are designated as "Ye Overseers' Observatory" and are stated to be "for the further convenience of sidewalk superintendents and excavating enthusiasts."





FOR NEW ANACOSTIA RIVER
BRIDGE (right) to
replace old structure at end of
Pennsylvania Ave.
in Washington, D.
C., Bethlehem Steel
Co. erects 50-ton
steel girders with
stiff-leg derrick
traveler. New
crossing has liveload capacity permitting passage of
20-ton trucks, provides two 28-ft.
roadways and requires 4,500 tons of
steel.





MILLION - DOLLAR HIGHWAY
OPENED. Four-lane Los Gatos-SantaCruz route, with width of 46 ft., is completed for California Division of Highways by Heafey-Moore Co. and Fredrickson-Watson Construction Co., contractors. New route eliminates 112
curves. Grading involved 2,183,000 cu.
yd. of earth and rock excavation.



LARGEST HOUSING PROJECT in United States, being built on 129-acre site in The Bronx, New York City, by Starrett Bros. & Eken for Metropolitan Life Insurance Co. includes group of 51 apartment buildings (7 to 10 stories) providing 12,269 living units in 42,000 rooms. Parkchester project requires the placing of cinder concrete, delivered by a fleet of nine 5-yd. truck mixers, in 12,000,000 sq.-ft. of floors.

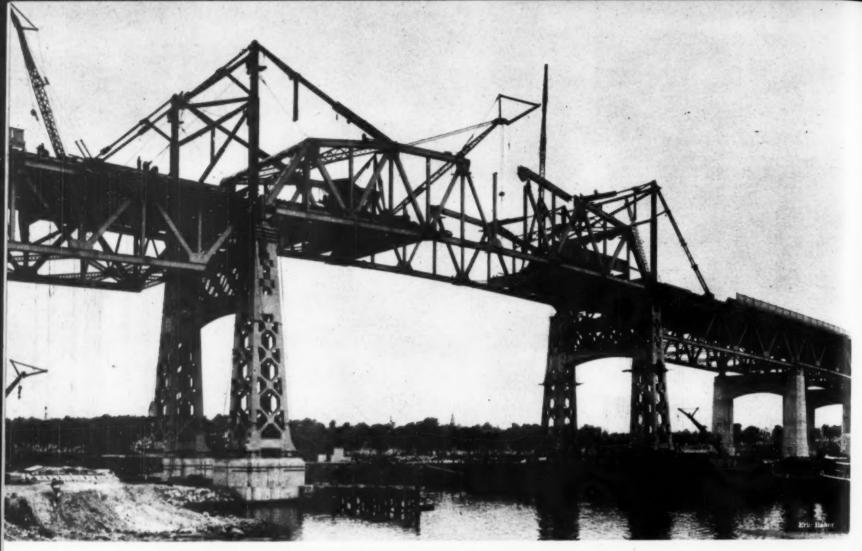


HOLED THROUGH! Headings meet on one of the 12 tunnels of the 30-mi. line of relocated railroad over which trains of the Southern Pacific Ry. will travel around the site of the U. S. Bureau of Reclamation's future Shasta reservoir, near Redding, Calif.



ROZA DIVERSION DAM (below) being built on Yakima River, Washington, by Morrison-Knudsen Co., of Boise, Idaho, for U. S. Bureau of Reclamation, is 55-ft.-high concrete structure to provide water to irrigate 72,000 acres of land in central portion of state. Dam is about ready to receive two 110-ft. roller gates, each 15 ft. in diameter.

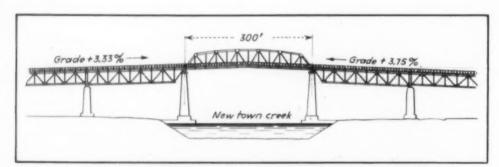




LAST LAP IN STEEL ERECTION of 17,000-ton structure occurs when derrick travelers approach closure point at mid-span.

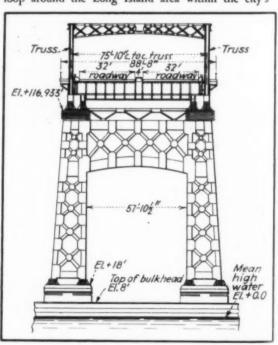
CANTILEVER METHOD

Erects 300-Ft. Steel Truss in Halves
With Closure Made by Hydraulic Jacks



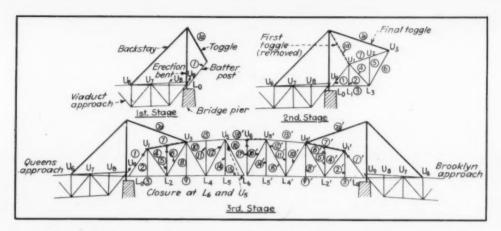
PORTION OF 6,150 FT. LENGTH of Meeker Ave. bridge showing 300-ft. main truss span over Newtown Creek and deck-truss approach viaducts. CROSS-SECTION OF MAIN SPAN (right), showing steel towers, cross-bracing and two 32-ft. roadways carried between trusses spaced 75 ft. 10 in, apart on centers.

TITH THE AID of toggle bents, suspended counterweights, derrick travelers and hydraulic jacks, the American Bridge Co. completed on July 5 erection by the cantilever method and closure of the 300-ft. main through-truss span of the Meeker Ave. bridge over Newtown Creek, which forms the dividing line between the boroughs of Brooklyn and Queens, New York City. The new bridge which, with its approach viaducts, is 6,150 ft. in length, provides a north-south traffic link, in the form of two 32-ft. concrete paved roadways, between sections of the circumferential highway system which is being built to provide a loop around the Long Island area within the city's





FIRST ERECTION STAGE COMPLETED with eyebar toggles connected to tops of batter-posts of bridge. Derrick traveler is setting steel truss members for later connection of eye-bar toggles to third panel points of upper chords of trusses. Backstay eye-bars are connected to counterweighted panels of completed deck-truss spans of viaduct approach.



THREE STAGES OF CANTILEVER ERECTION of 300-ft. steel trusses, showing erection bent and eye-bar toggle connection to two successive points on top chord. Numbers indicate sequence of erection of steel members of truss. Closure is made at panel points U5 and L6.



SECOND ERECTION STAGE, showing cantilevered portion of bridge suspended by eye-bar toggles from third panel points of top chords of trusses. Derrick traveler is setting final steel members near point of closure of span. Original toggle connection to batter-posts has been burned off.

limits. Erection of the main span, involving 17,000 tons of steel, was begun March 13 and required less than 4 months to complete. Previous articles on the Meeker Ave. bridge have covered the pier cofferdams (Aug., 1938, p. 58) and the concrete viaduct approaches (July, 1939, p. 46).

Because the 250-ft. wide channel of Newtown Creek had to be kept open for marine traffic no falsework or other obstructions to navigation could be used in erecting the main span of the bridge; the contractor, therefore, elected to employ the cantilever method. The ends of the previously completed deck-truss viaduct approach sections, terminating at 100-ft, high steel towers on concrete piers at each side of the channel and having an overall width of 88 ft. 8 in., offered a working area about 125 ft, above mean high water in Newtown Creek from which to proceed with the cantilever erection of the 300-ft. main span from both

ends. The two trusses of the main span are spaced 75 ft. 10 in. apart on centers.

As a guide for field operations the contractor developed a detailed plan of procedure in which the major steps of the cantilever erection were indicated in proper sequence, as shown in the accompanying sketches which illustrate how the work was carried in three main stages. The principal items of equipment at each end of the span were a derrick traveler with 90-ft. boom and 20-ft. jib attachment, having a rated capacity of 30 tons, for setting the heavier steel units of the truss, a crawler crane behind the derrick traveler for handling the lighter steel members of the floor system, and powerful 500-ton hydraulic jacks for adjusting and shoving into final position the cantilevered halves of the trusses in order to complete closure of the span at its center.

Provision had to be made for balancing the weights of the cantilevered THE CHIEF INSPECTS THE JOB
(right) on day of
closure of span. J.
FRANK JOHNSON
recently appointed chief engineer
of New York City's
Department of
Public Works.





VIADUCT APPROACHES to main span of Meeker Ave. bridge consist of steel deck-truss spans and reinforced concrete deck spans (not shown), giving bridge a total length of 6,150 ft. Traveler is setting steel for first erection stage of cantilever span.

ERECTION BENT is made up of vertical posts, horizontal struts and diagonal brace, with backstays of eye-bars connected to viaduct approach trusses.

ON FIRING LINE (right) in charge of field operations for bridge erection are D. M. WOOD, superintendent for American Bridge Co., and NATHAN DEUTSCHMAN, resident engineer for New York City's Department of Public Works.

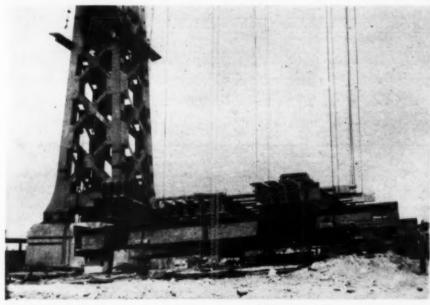
portions of the main truss span, as erection proceeded, with counterweights of 200 tons on the Brooklyn end and 125 tons on the Queens end of the approach viaducts. Instead of piling the counterweights (which consisted of floor beams, stringers and other heavy structural steel members scheduled for later erection) on the decks of the approach viaducts in back of the main steel towers, these weights were hung in bundles a few feet above ground level by steel cables from the deck trusses of the approach viaducts, thereby removing cumbersome obstructions from the working areas at the ends of the main span. The heavier counterweight (200 tons) on the Brooklyn end was required to balance one more panel of top chord construction than was handled from the Queens end of the bridge.

Cantilever erection of the two halves of the 300-ft. truss was carried on simultaneously from both ends, in three stages, as indicated in the sketches herewith. At each end of the truss the first operation was to set up a toggle bent for erection purposes only. This erection bent consisted of a pair of latticed vertical posts 65 ft. high braced by two horizontal steel struts and a single diagonal, as shown in one of the photographs. From its top a pair of backstays, in the form of steel eye-bars, were carried downward at a slope to connections with the counterweighted deck trusses of the approach viaducts.

With the erection bent in place and the derrick traveler advanced to the end of the viaduct approach, the first operation on the main span consisted of setting the batter posts of



Page 44 — CONSTRUCTION Methods and Equipment — September, 1939



counterweights, in form of beams and girders, to balance load of cantilever, are suspended by cables from approach viaduct trusses, leaving deck clear of obstructions for erection of steel.

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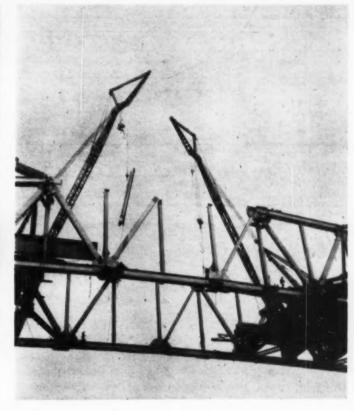
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the trusses and joining their top ends to the posts of the erection bent by means of a group of auxiliary steel eye-bar toggles. With this initial step completed, erection of subsequent members of the truss proceeded in the sequence indicated by the members on the accompanying diagrams. It will be noted that the transition from the first to the second erection stage is marked by attaching the top chord of the truss to the main set of eye-bars and then cutting loose the auxiliary eye-bars. Until the toggles were connected in their second and final position, the front legs of the derrick traveler were not allowed to proceed beyond the end of the first panel of the truss.

After the toggles were in position for the second erection stage, the span was raised by jacking at the

third panel point of the upper chord and the first toggle connections with the batter-posts were removed by burning off the ends of the auxiliary eye-bars with an oxyacetylene torch. The jacks were then returned to their original settings, causing the load of the cantilever structure to be carried by the toggle connections in the upper chords of the third panels of the trusses. The remaining members of the halves of the truss were then set by the derrick travelers, working from each end of the span, and constituting the third stage of erection

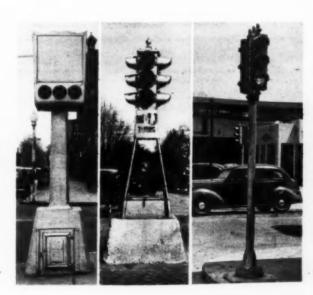
With the completion of the third stage, the two halves of the bridge, separated by a distance of about 5 in. at the center, were shoved together for final closure of the span by 500ton hydraulic jacks, located at the ends of the bottom chords and in the upper chords at the third panel points from each end. The lower chord jacks had a runout of 8 in, and the jacks in the upper chords a runout of 25 in.

With reference to the diagram for the third stage of the cantilever erection, detailed instructions for the closure of the span were as follows: "Jack at LO and LO¹ until shoes come to proper position on towers. Bolt shoes in position. Unlock roller nests at LO¹ and jack at LO¹ and U3¹ until bottom chord closes at L6. Close top chord at U5 by releasing jacks at U3 and U3¹. After connecting at U5, gradually release jacks at U3, U3¹ and LO¹ until all jacks are free. Jacks at LO¹ must be released gradually during this operation

to permit LO¹ to move toward Brooklyn approach, as the jacks at U3 and U3¹ are released and the bottom chords assume their load. There will be no movement at LO, but the shims at this point must remain in place until all jacks are free. Then, erect balance of floor beams and top and bottom chord bracing. Remove toggles 7a and 7a¹ and complete erection of floor system."

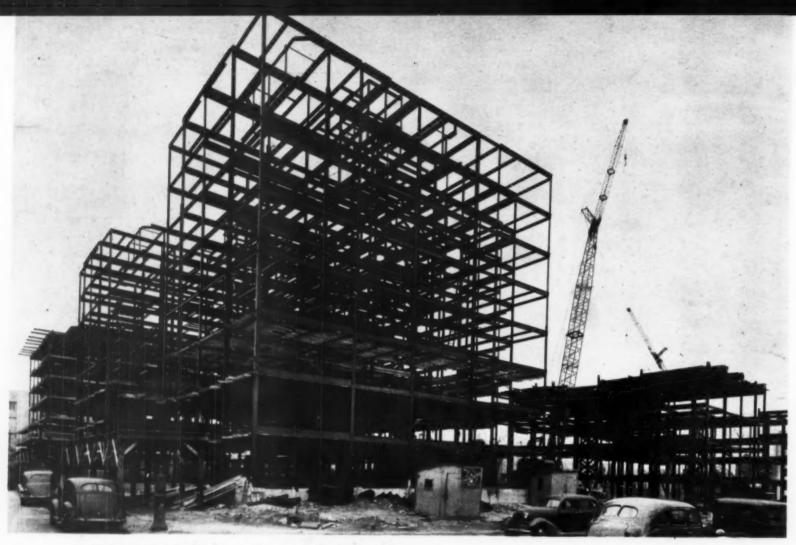
Personnel—For the Department of Public Works of New York City, Irving V. A. Huie is commissioner, J. Frank Johnson, chief engineer and Nathan Deutschman resident engineer in charge of the Meeker Ave. bridge. For the American Bridge Co. on the erection of the steel work D. M. Wood served as superintendent.

Indiana
Modernizes
TRAFFIC
CONTROL
SIGNALS



BSOLETE TYPES of traffic control signals (left and center) are being replaced on state highway routes in Indiana by the standard type signal shown at the right of the accompanying illustration. As a result of studies made by highway officials, a number of traffic control signals have been removed; others have been modernized, and still others have been moved to more effective locations. Completion of surveys now in progress according to Commissioner T. A. Dicus, will probably result in additional revision of control signals on state highway routes.

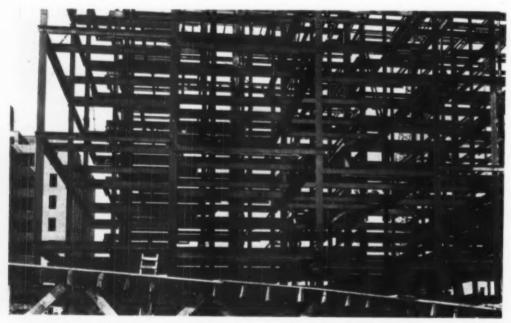
The new traffic code provides that the State Highway Commission examine all traffic control signals on state highway routes, approving those found necessary and removing those found unnecessary. In past years many traffic signals were erected to meet conditions which have since changed, or without a study of proper control methods.



TWO TRUCK CRANES with long booms erect 2,000 tons of steel to maximum height of 75 ft. in five apartment houses. Cinder concrete crew follows closely behind steel erectors.

STEEL-ANGLE COLUMNS

Reduce Framing Costs in 8-Story Apartment Houses



STEEL ANGLES, used double or single, form weight-saving columns of eight-story apartment-house skeleton. Beam connections are made to angle legs or to plates riveted between angles of double-angle columns.

Y UTILIZING STEEL ANGLES for all columns in the skeleton frames of five eight-story fireproof apartment houses built by David Rose in Park Terrace Gardens, New York City, the designers reduced the steel tonnage required and lowered construction costs to a point which puts this class of structure on a competitive basis with non-fireproof, six-story residence units permitted by the city building code. Light weight of the steel angles facilitated shop fabrication and field erection. In the shop, framing members were punched and connections were riveted, but in the field all connections were completed by bolting. Two truck cranes with long booms erected 2,000 tons of steel in the five buildings to a maximum height of 75 ft. The erectors used 146,000 bolts in making the field connections.

Size of Buildings — On a basis of floor area, the weight of steel amounted to 8 lb. per square foot. Each building has an area of 10,651 sq.ft., with 36 rooms per floor, giving an economical room area of 300 sq.ft. per room. The cube of each building is 874,000 cu.ft., and the total number of rooms, including a penthouse and a janitor's apartment in the basement, is 278, which gives a cube per room of 3,143 cu.ft.



SINGLE STEEL ANGLE functions as column corner of building. Angle legs are buried corner of building. Angle legs are buried in masonry wall laid up by bricklayers from suspended scaffold.

Steel-Angle Columns - Except for corner columns, which are single angles, vertical members of the structural frame consist of double angles, shop riveted into units two stories high, with connecting plates for beam connections ordinarily riveted between the two angles. These connecting plates take care of beams running in one direction; beams in the other direction are bolted to the flat faces of the legs of the steel angles, the flanges of the beams being coped to permit bringing the web into contact with the angle legs.

Where erection conditions permitted, the connecting plate was omitted during column fabrication, and beam flanges were coped to allow the web to be inserted between the angles of the column for bolting. This type of connection was possible only where the other end of the beam was to be bolted to the flat face of a column and, accordingly, could be moved endways without restraint.

Story height in the apartment houses is 9 ft, 2 in., and the unbraced length of columns is 8 ft, 6 in. For eightstory residence buildings designed to sustain uniform live loading of 40 lb. per square foot, angle columns proved economical; but, even in these structures, it was necessary in a few cases to build up columns in the bottom tier by addition of cover plates. For taller buildings, the cost of built-up angles in the lower tiers would consume any savings in the upper tiers.

DOUBLE - ANGLE COLUMN (left) with shop-riveted and field-bolted splice is typical of interior columns.

NO CORNER BREAKS are necessary in rooms adjoining steel-angle column. Projecting legs of column will be con-cealed by partition of plaster on wire lath.

As one example of the weight-saving possible with steel angles, the New York City building code requirement that exterior steelwork have a minimum thickness of 0.3 in. could be met with two 31/2x3x5/16-in, angles having a total weight of 13.2 lb. per foot, whereas the smallest H-section of 5/16-in, minimum thickness is an 8x8-in. section weighing 31 lb. per foot.

Maximum permissible stress in columns under the New York City building code is 15,000 lb. per square inch. With angles of the size required to carry vertical loads in the apartment structures, it was possible to obtain economical column designs which approached

the maximum permissible stress.

Preliminary Studies - Before selecting steel-frame design for the buildings, Albert Goldhammer, architect for Mr. Rose, made intensive cost studies of various types of construction. On the basis of a framing design prepared by Knopf & Storch, structural engineers, New York City, calling for use of angle columns, the steelframe fireproof building with reinforced cinder-concrete floor arches proved most economical, all factors being

Advantages - In comparison with six-story non-fire-

(Continued on page 92)



CTT —Red Hook Houses opened for occupancy in July. Project costing \$13,000,000 comprises 2,541 dwelling units in 25 buildings, located on 40 cores of land. Vacurum mats (head) were used to remove excusal value from concrete in floors, thus speeding finishing opeartions.



MASS
HOUSING
HITS ITS

STRIDE

Phetos by

HOUSING-AUTHORITY

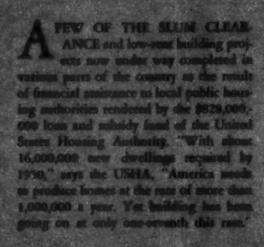


APRIORYA, Gift. -- Olmsted Homes, scheduled for eccupancy in October, consist of 187 dwelling units: Cost of project, \$807,572.





Allertal. 1986 - Same fine project provides & dwelling units at cost of \$146.204. Walls of buildings one of hollow the lated up as commit morter.



Part project comprises 220 dwelling units in one and two-stery analysis back structures on \$4.



particular 140 chrolling units. Cost of project, \$700,413.



Housing Authority to designed to contains with mosters, well built senting structures.





AND REAL PROPERTY OF THE PROPE

LINING UP SECOND SECTION of six-pipe crossing 640 ft. long, prior to making final weld before pulling across river.

RISER BENDS at end of pipe line (right) supported by two marine derricks, move out into inshore cut near shore line.

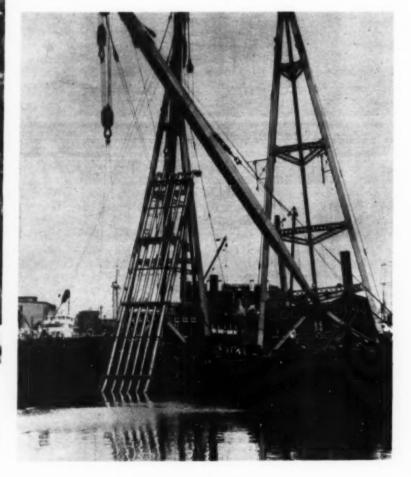
Six Under-River Pipe Lines LAID AS UNIT

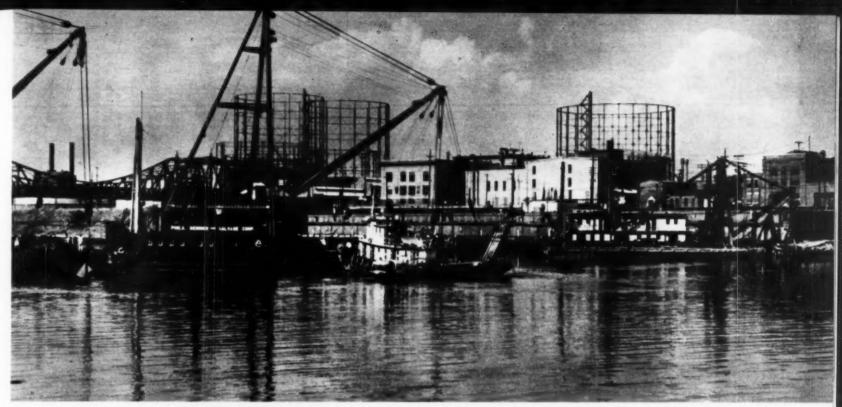
Pulling Across 500-Ft. Wide Stream Requires Only 30 Min.

NUMBER OF UNUSUAL PERFORMANCE REC-ORDS were established July 1 when Atlantic Refining Co. engineers and construction crews completed a difficult under-river section of a pipe-laying job across the Schuylkill River at Point Breeze, Philadelphia, where the company's Philadel-phia refinery is located. The pipes were laid under the river to replace and add to lines, some of which were laid nearly a half-century ago. All of the work was done by the company's own engineers and construction crews, working under permit from the War Department and to the depths specified by Army engineers.

At Point Breeze the Schuylkill is approximately 500 ft. wide, with a 300-ft. wide, 30-ft. deep channel. The War Department required that the pipes be laid in a trench dredged to a depth of 47 ft. below low water. Atlantic specifications called for two lines of extra strength 12-in. pipe with ½-in. walls, three lines of extra strength 8-in. pipe with ½-in. walls, and a 4-in. steam line insulated with 1½-in. magnesia, and cased with 8-in. extra strength pipe.

The 12-in. lines are provided to carry crude oil from tankers unloading on the west bank of the river to the refinery pipe lines on the east bank. Two of the 8-in. lines will carry gasoline and furnace oil from the refinery on the east bank to the Keystone Pipe Line terminal on the west bank. The third 8-in. line will serve as a utility line. The steam line will carry steam from the refinery





AT HALF-WAY MARK across river 15 min. after pull-across of six-pipe line was started.

boiler house on the east bank to the water and fire pumps on the west bank.

River traffic is normally heavy at this point on the river. To prevent stoppage of this traffic for more than a minimum period, and because it was known that the trench dredged for the lines would fill very rapidly with silt, it was decided to pull all six pipes across the river at the same time. Another consideration was the fact that fastening the lines together would provide a structural unit that would keep the steam line straight and in position. That these considerations were soundly based is indicated by the fact that the lines were pulled across the stream in just 30 min.

Preparatory Work - In preparation for the final pull-across, the six lines were assembled on the west bank of the river and were fastened together by clamps or structural strongbacks, spaced every 80 ft. To overcome the buoyancy of the 12-in. lines, cast-iron ballast clamps weighing 1,250 lb. each were placed at 40-ft. intervals on these lines. Six-hundred-pound cast-iron ballast clamps were placed at 40-ft. intervals on the 8-in, lines, As protection against corrosion and abrasion, the lines were given a coat of corrosionresistant paint primer, followed by a coar of hot enamel. They were then spirally wrapped with impregnated asbestos. This was followed by a second coat of hot enamel, a second spiral wrapping with the impregnated asbestos, and a final coat of hot enamel

Existing wharf and bulkhead construction on the east bank of the river made it necessary to provide 70-ft, riser bends, rising at an angle of 60 deg, from the pipe line trench in the bed of the stream. These riser bends were constructed as a complete rigid unit by clamping the six lines together inside a specially designed structural frame. When completed, the riser bends were raised to their inclined position, welded to the straight section assembled on the west bank, and held in place by guy lines.

Due to physical conditions on the west bank it was impossible to assemble the six lines in one 640-ft. unit. Two 320-ft. sections were assembled and welded on special runway tracks. The first section, of which the east bank riser bends were a part, was assembled on the center line of the crossing. The second section was assembled parallel to the first section on cribbing and rollers designed to allow it to be moved to the center line of the crossing after the first section had been pulled part way out into an in-shore cut made in the river bank for this purpose. The two 320-ft, sections were then welded together for the pull across the river.

The total weight of the lines to be pulled across the stream amounted to 404,524 lb. To prevent damage to the lines while being dragged across the bed of the river, each pipe was provided with 4x4-in. continuous oak skids. These were clamped by Ubolts to the pipes, presenting a flat, level surface, and acting as sled runners for the lines as they slid across the river bottom.

The problem of supporting the riser bends when the first section was moved out into the inshore cut was solved by suspending them between two marine derricks. When

(Continued on page 92)



AT SHORE END of line riser bends are lowered to foundation of east bank anchorage.

Today Cle

Fleet of Cletracs and apers travel in steady, ntinuous procession h big loads on every trip.

ITACS on Fennsylvania's Super Highway

Pay after day, Cletracs are performing the leading part on Pennsylvania's new super highway—one of the world's largest road construction jobs. Because the equipment must deliver to avoid drastic penalties, Jacobson and McKinley; County Construction Company; Swaney Construction Co.; L. M. Hutchison; and George Vang, Inc., are relying on Cletracs, more than 40 of which are working in three shifts. With Cletrac power and Cletrac on-the-job service, work is progressing ahead of schedule.

THE CLEVELAND TRACTOR CO. . CLEVELAND, OHIO

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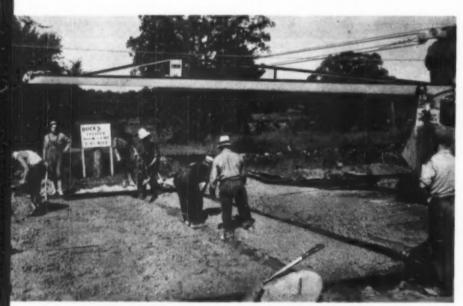
14 to 95 HORSEPOWER . GASOLINE OR DIESEL

Bulldozing big piles of earth and rocks takes power. Cletracs have it

34E DUAL-DRUM PAVER, mixing two 37.4-cu.ft. batches simultaneously in double compartments of revolving drum, places 10-8-10-in, pavement 30 ft. wide at average rate of 115 to 120 lin.ft, per hour.



LONG BOOM spreads large batches in second course of 30-ft. slab after lower course has been struck off by screed behind paver.



AFTER SCREED drawn by paver behind subgrade planer has struck off lower course of concrete for longitudinal steel, workmen trench out transverse strip for expansion joint.



BIG DOUBLE-DRUM PAVER Lays 30-Ft. Slab

On Wisconsin

Three-Lane Road

34E DUAL-DRUM PAVER, working a maximum of 8 hr. and an average of 61/2 hr. per day on a contract of the J. R. Griffith Co., Racine, Wis., for the Wisconsin Highway Commission, completed 43/4 mi. (80,136 sq.yd.) of 10-8-10-in, concrete pavement 30 ft. wide in 32 working days, mixing from 52 to 69 batches per hour. The contract involved the first section running north out of Beloit in an improvement of U.S. 51 between this city and Janesville. In spite of delays occasioned by heavy rains and by the urban character of the road, which could not be closed to local traffic because it is built up with residential properties on both sides for most of the contract distance, the mixer maintained an average of almost 800 lin.ft. of 30-ft. width per day for the entire 32 days. Batch volume during the first week's paving operations was restricted to 33 cu.ft., until trucks could be converted to take 37.4 cu.ft., the allowable batch for the 34E paver with 10 per cent overload.

Three-lane slab constructed on U.S. 51 is probably the last pavement of this design to be built by the State Highway Commission, which, despite contradictory evidence from the nearby state of Michigan, deems threelane roadways unsafe for two-way traffic. Originally planned as a 30-ft. pavement several years ago, the three-

HEAVY EXPANSION JOINT AS-SEMBLY (left) supported by spe-cial steel frame is placed in 30-ft trench by nine men.

lane slab still appeared the most practical design for a 99-ft. right-of-way, recently increased to this width by adding 33-ft. parallel property of an abandoned interurban line to the old 66-ft. highway strip. Cost of additional right-of-way, especially in the south 4 mi., would have been almost prohibitive because of the many houses and buildings adjacent to the road. As a compromise measure, a concrete sidewalk was built on one side of the road in the south 4 mi. to accommodate school children and pedestrians.

Because the contract called for placing monolithic slab to the full 30-ft. width, with only ribbon-type longitudinal joints separating the 10ft. lanes, the contractor had to forego use of a 20-ft, mechanical subgrade machine and a mechanical bull float previously operated on other contracts. In his opinion, the relatively short length of the Beloit job did not warrant rebuilding these machines to the 30-ft, width.

Concrete Parement - As a preliminary to construction of the new concrete slab, the contractor demolished and removed 36,000 sq.yd. of old concrete pavement and improved and widened the grade by moving 31,000 cu.yd. of common excavation and 12,000 cu.yd. of borrow. On the fine grade as finally prepared, the new slab was laid between steel edge forms 30 ft. apart. The slab is 10 in. deep at the edge and reduces to a thickness of 8 in. by straight taper in a distance of 2 ft.

Expansion joints 3/4 in. thick were

Daily Batch Production

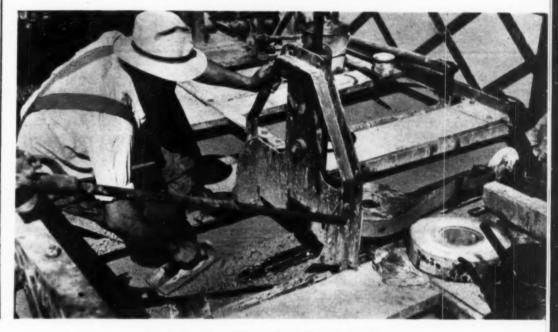
34E DUAL-DRUM PAVER

J. R. Griffith Co., Racine, Wis., Contractor

Date	Net operating time, ht.	Number of batches	Batches per hour
Aug. 2	6	234	36
3	71/2	412	55
4	71/2	437	58
6	71/2	462	62
8	1	52	52
9	8	488	61
10	63/4	406	60
11	8	516	65
12	63/4	418	62
13	7	394	56
15	03/4	17	24
16	2	110	55
17	8	414	52
18	7	408	58
19	7	460	66
20	5	306	61
22	6	360	60
24	8	498	62
25	7	432	62
26	8	512	64
27	8	514	64
29	8	496	62
30	7	442	63
31	8	524	66
Sept. 1	8	534	67
2	8	548	69
6	6	312	52
. 9	6	372	62
12	8	494	62
13	8	520	65
15	7	360	52
16	3	180	60
	2093/4	12,632	60.2



GASOLINE-POWERED VIBRATORS consolidate concrete around transverse joint. Steel supporting frame has been partially withdrawn, at left.



RIBBON-TYPE LONGITUDINAL JOINT is installed from power-driven carriage between 10-ft. lanes of 30-ft. pavement.

installed at intervals of 100 ft., with intermediate contraction joints at 25-ft. spacing. Both types of transverse joints are heavily doweled. Joint filler and dowel bars were held in place by special steel chairs until concrete had been placed on both sides of each point. Longitudinal ribbon joints were installed by a traveling carriage before the finishing machine made its final pass.

Fine Grade - Because of the difficulty of building rough grade close to final cross-section profile on this contract, the contractor did only quick preliminary roughing in with large tractor-scraper and tractor-blade outfits, leaving considerable cutting to be done later in the vicinity of the form-setting operation with smaller tractor-drawn scrapers and blade machines. Final grading between the forms was completed with a Lakewood subgrader. The form crew was equipped with 3,200 lin.ft. of Metaform steel road forms, sufficient for 1,600 lin.ft. of road.

Paver Operation — Mixing in the two-compartment drum of a Koehring 34E twin-batch paver increased production on the job 30 to 70 per cent above the probable output of a standard 27E unit on the same work. All operations of the mixing cycle

were controlled by an automatic timing device set in motion by elevation of the mixer skip. The cycle could be suspended at will by the operator if he was not ready to have a batch discharged into the bucket. A transfer chute between the two drum compartments automatically moved a batch ahead from the first compartment to the second at the proper point in the cycle.

About half the mixing was accomplished in the first compartment, and the remainder in the second. The Highway Commission specified a 72sec. mixing cycle for each batch, from skip elevation to discharge, which includes 60-sec. mixing time plus allowances for sliding time and transfer time. Sliding time to assure full cleaning of the skip amounted to 5 sec., and transfer time from the first compartment to the second was 9 sec., of which 7 sec. was deducted from the cycle. As adjusted to fit the 72-sec. batch cycle, paver operation called for a minimum of 47 sec.

CEMENT CARTS built up with welded extensions handle 703 lb. of bulk cement per batch. One man takes care of dumping both carts into two-batch truck.



TWIN BATCHING PLANTS served by one crawler crane shuttling between them load sand and two sizes of gravel into batch trucks. Side boards have been added to trucks to carry 37.4-cu.ft. batches.





FOURTEEN WELL POINTS and 6-in centrifugal pump furnish wash water to sand and gravel plant.

between skip elevations. According to the paver manufacturer, the transfer movement really is part of the mixing action and does not require deduction from the mixing time.

Batch Production - As indicated by the accompanying table, the twinbatch paver operated 2093/4 hr. in 32 working days and produced an average of 60.2 batches per hour. Hauling conditions at times had an unfavorable effect upon batch production records. After subgrade difficulties (suggested in a previous paragraph) had been corrected, heavy rains with resultant wet grades and haul road prevented the contractor from maintaining the high rate of progress shown on occasional days. With good weather, a rate of 70 batches an hour could be maintained.

Batch Weights - A 20 per cent overcharge of 27E pavers has been permitted in Wisconsin for several years, and batch trucks rented by the contractor were equipped to handle batches of this size. As soon as the trucks and bulk-cement carts at the batching plant could be built up to take larger volumes, the batch was increased to 37.4 cu.ft. (34 cu.ft. plus 10 per cent overload). No change was required in the aggregate weigh batchers. An accompanying table gives dry batch weights, as well as weights actually used under typical moisture conditions. The cement factor was 1.35 bbl. per cubic yard, and the maximum water permitted was 5.4 gal. per sack. Concrete normally had a slump of 1 to 11/2 in.

Gravel Plant — Aggregates were produced and loaded under subcontract by the South Milwaukee Sand Co. at a crushing, screening and batching plant set up on a railroad siding adjacent to a gravel pit near

Ingredient	Dry wt.,	Typical wt. (incl. moist.) lb.
33-CU. FT.	ВАТСН	
Cement	620	620
Sand	1,399	1,473
Small gravel, 1/4 to 1/2 in.	1,122	1,161
Coarse gravel, 1/2 to 11/2 in.	1,690	1,726
37.4-CU. FT.	ВАТСН	- :
Cement	703	703
Sand	1,586	1,662
Small gravel	1,272	1,333
Coarse gravel	1,915	1,952

the north end of the job and about 1/4 mi, from the road being paved. A Lippman Engineering Works crushing and screening plant produced about 1,000 tons of aggregate per day, in two shifts totaling 16 hr., sufficient to keep the twinbatch paver operating 8 hr. The gravel contained an excess of sand. Water for washing was obtained from a battery of fourteen well-points, sunk at a low point in the gravel soil, by a C.H. & E. 6-in. centrifugal pump.

Cement was unloaded out of box cars by hand-shoveling into carts. The carts dumped through canvas spouts into the batch trucks, two carts being put in position to load the two batches simultaneously on each hauling unit. For the maximum haul of 5 mi. from the batching plant, the big paver required a fleet of seventeen two-batch trucks to keep it supplied with materials.

At the batching plant, two Butler steel bins equipped with weighing hoppers measured the three sizes of aggregates. A Koehring crane fed material from stockpiles to both bins.

Concrete Finishing — A single-screed finishing machine made an average of five passes over the fresh concrete to give it a good surface finish. Specifications required a minimum of three passes, with a travel distance of at least 40 ft. on the final pass. Transverse joints were prefabricated on the job at the side of the road in heavy steel frames, or chairs, and were set in place intact. The frames were removed from each joint after concrete had been placed and before the finishing machine made its first trip across the joint.

Specifications required that con-

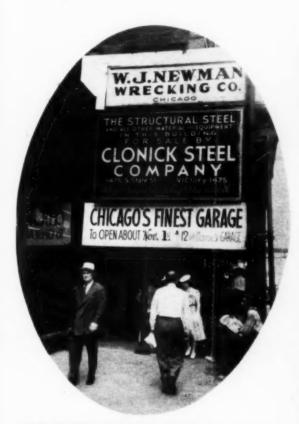
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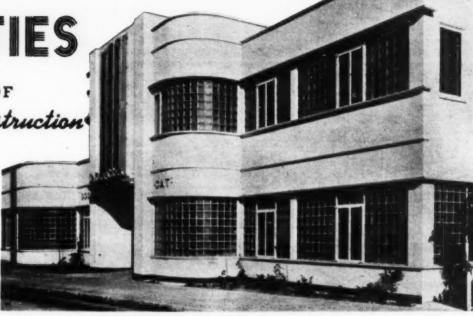
SIDEWALK CONSTRUCTION included in contract makes use of 1½-yd. truck mixers delivering concrete from commercial plant.

JOB ODDITIES

A MONTHLY PAGE OF Unusual Teatures of Construction



"SKYSCRAPERS, SLIGHTLY USED." Thus reads a sign advertising old steel for sale on one of Chicago's tall buildings which is being razed by W. J. Newman Wrecking Co.



DOG HOUSE. NO KIDDING! Here's the de luxe two-story structure, with glass block wall panels, which Dr. Eugene C. Jones, veterinary, has built in Los Angeles to serve as a dog and cat hospital. Noises from barks, yelps and yowls of inmates are deadened by treating all rooms and corridors with perforated, cane fibre, sound-absorbing Celotex panels.



UNCLASSIFIED EXCAVATION. In building Pan-American Highway in Peru, operators of fleet of 52 International diesel-powered tractors and other earth-moving equipment uncovered scores of skulls and bones, evidence of the ancient Inca civilization which occupied the region covered by the new route.



SEA FOOD SPECIAL. As pipe line from big dredge of Arundel Corp. discharges fill from Jamaica Bay for Shore Line Highway under construction in south Brooklyn, New York, sea gulls congregate to pounce upon tid bits in form of small fish, crabs, clams and other delicacies which are pumped up with the sand and water from the bottom of the bay.

"CAISSON COFFIN" is name applied to small-diameter, cylindrical bucket (below) lowered into hole to permit inspection of tremie-placed concrete in adjacent 84 ft. deep foundation pier for Montgomery-Ward building in Chicago. Caisson shaft is bored out, without lagging, by rotary cutter head on machine devised by W. J. Newman (in bucket) contractor, of Chicago. Alongside Mr. Newman are E. W. Byers and Frank A. Randall, consulting engineers for Montgomery-Ward & Co.



How They Did It

TREMIE HOPPER AND PIPE are used by crew of Johnson, Drake & Piper, Inc., contractors, of Freeport, N. Y., for pouring concrete into pipe pile substructure for piers of Cross Bay bridge at Rockaway Beach, N. Y. Tremie consists of 1-yd. hopper and 90 ft. of pipe which is entered into 18-in.-diameter pipe pile after excavation is completed. Tremie first is lowered by floating derrick boom to bottom of pipe pile. Concrete then is discharged into hopper from bottom-dump concrete bucket, and as concrete flows down through pipe unit is hoisted, keeping bottom of tremie pipe below level of concrete to exclude water from wet concrete and prevent separation of cement from mix.—Photo from J. H. LEVY, formerly resident engineer for Johnson, Drake & Piper, Inc., Freeport, N. Y.



ROTARY CUTTER HEAD (inset) sinks shafts for caissons 84 ft. deep through Chicago clay, without wooden lagging, for foundation of building extension of Montgomery-Ward & Co. Vertical 12-in. pipe rotates cutter and feeds water into hole, forming core of liquid mud

12-in. pipe rotates cutter and feeds water into hole, forming core of liquid mud which prevents caving of side walls and is later displaced by concrete poured through tremie to fill hole. Method and machine (below) were devised by W. J. NEWMAN, Chicago contractor shown in picture standing on his tractor-powered boring rig.



YELLOW TRAFFIC STRIPE (left) is painted along center line of Indiana's state highways to indicate "no-passing zone," as one of many aids to motoring safety. Yellow line is placed parallel to center line but on traffic lane from which passing is restricted. If there is no yellow line on motorist's side of center line he is free to pass slower moving vehicles. Passing is prohibited at points where clear sight distance ahead is less than 750 ft.

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Construction Details for Superintendents and Goremen



HOMEMADE CRANE BOOM. consisting of pair of logs, is rigged on 1/2-yd. Bay City power shovel by Bert Shelton, of Baker, Ore., to facilitate job of loading logs on motor truck which hauls them to mill 25 mi. away.



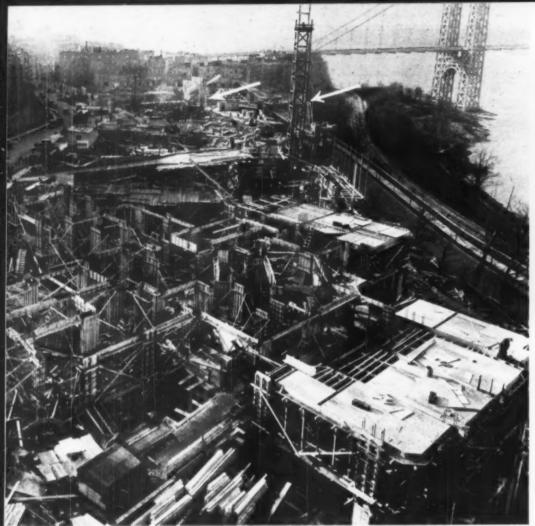
LADDER ACROSS MANHOLE OPENING provides series of slots for holding and shifting to new positions funnel of vertical chute into which concrete is poured by truck-mixer for floor and roof slabs. Hole is 16 ft. in diameter and 8 ft. deep. Method was used by Stiers Bros. Construction Co., of St. Louis, Mo., on work for Memphis (Tenn.) Light Gas and Water Division. — Photo from J. L. MORRIS, Memphis, Tenn.





REFLECTING CURB (left) for safer night driving is installed on state highways in New Jersey. Used extensively as border for center safety islands on divided roadways, curbing of precast concrete units rises at slant to height of 7 in. and its surface is ribbed with elevated faces which reflect automobile headlight beams and indicate alignment of highway.

TO PUSH PIT GRAVEL to hopper for loading trucks on road-building job near Preston, Idaho, Carl E. Nelson, contractor, of Logan, Utah, uses 97-hp. Caterpillar diesel tractor equipped with bulldozer. Gravel is fed on to inclined belt conveyor which delivers to hopper over truck runway.





TWO MIXING AND HOISTING PLANTS (indicated by arrows) are centrally located to supply concrete for five apartment houses and one garage (left). Portion of 125,000 sq. ft. of plywood and 1,500,000 bd.ft. of lumber already has been delivered on job.

ONNECTED BY TOWER-ING SCAFFOLD BRIDGES to five tall apartment house structures overlooking Riverside Drive and the Hudson River, New York City, two mixing and hoisting plants of Walter Kidde Constructors, Inc., New York, concrete contractor for Dr. Charles V. Paterno, owner and builder, supplied 26,000 cu.yd. to a total of 70-odd floors in the five units between the months of November and May, placing the bulk of this volume under the most adverse conditions between Dec. 1 and April 1. Ample heat for aggregates and water and an abundance of forms, salamanders and tarpaulins for the structures made it possible to place and protect columns, beams and floor slab when atmospheric temperatures were low, but only the grit and determination of the contractor's working force enabled construction to proceed at fair-weather speed in the face of bitter northwest winds which

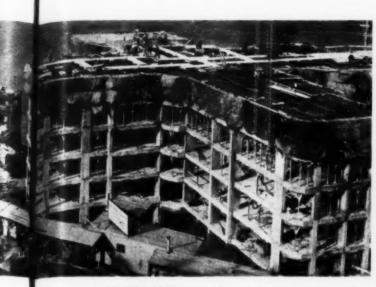
WINTER CONCRETING

For Five Tall Buildings

Handled by Two Central Plants







DURING NIGHT preceding concrete pour in progress on building at right, tarpaulin-inclosed floor under forms has been heated by salamanders to prevent freezing of freshly deposited concrete.



GOING UP in step with two adjacent buildings, scaffold bridge affords access from concrete hoist tower to units No. 4 and No. 5.

struck the exposed location with unbroken fury. In the four coldest months, the constructors placed 49 full floors, not to mention subfloors below the level of the first floors. During January and February, the progress record shows 24 full floors completed, in addition to subfloors for two buildings. This progress was made on the basis of a work week of five 7-hr. days, with some of these days eliminated by snow and rain.

Five Apartment Buildings — At a total cost approaching \$4,000,000, Dr. Paterno has erected on the crest of a cliff about 200 ft. above the Hudson River five reinforced-concrete-frame apartment houses containing 468 living units of more than 2,300 rooms. The buildings are designed in the shape of Maltese crosses to provide a view of the river and of

the Palisades on the New Jersey side to dwellers in all apartments except one small unit on each floor.

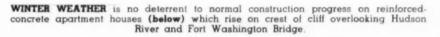
Foundations of all the buildings are solid rock, which is uncovered a short distance below the surface. The land in the plot rises south to north, the same direction in which the buildings are numbered in an accompanying plan. Three buildings at the lower end of the site are 13 stories high, No. 4 is 12 stories, and No. 5 is 11 stories. A reinforced-concrete garage below the level of the first floors in the last two apartment houses provides club facilities for tenants as well as storage space for cars.

Story height in the apartment

houses is 9 ft. 2 in., floor to floor, and the floor area in each building is about 10,000 sq.ft. Reinforced one-way floor slabs average 6 in. in thickness, and girders have a uniform depth of 18 in. Including 4,000 cu.yd. of concrete for the garage, the total volume of concrete required was 30,000 cu.yd. Reinforcement for the apartment house buildings amounted to some 2,000 tons of steel, a little less than 30 tons per floor. Garage reinforcement called for 300 tons additional.

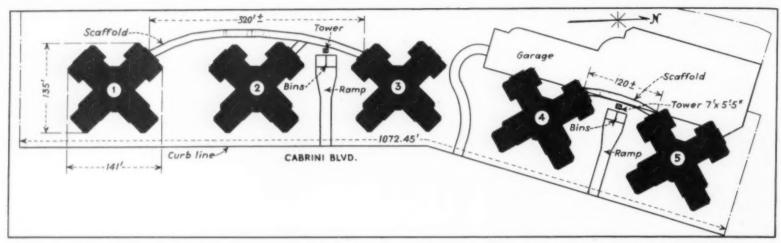
Two Concrete Plants — Spotting two mixing and hoisting plants in central locations between buildings, as indicated on the accompanying plan, proved a happy solution to the problem of how best to produce and distribute concrete. By means of a long connecting bridge, one plant served three apartment houses. The second plant supplied concrete to the two other houses, and, finally, furnished 4,000 cu.yd. for the garage after completing the apartment build-

Rapid charging of the mixer by means of a simple and effective volume batching plant (illustrated in an accompanying sketch) facilitated large-volume production per hour through each plant. Cement was dumped from sacks into a tin-lined cement batch box mounted on a half-round roller bar. A hand lever tipped the batch box, and the cement flowed

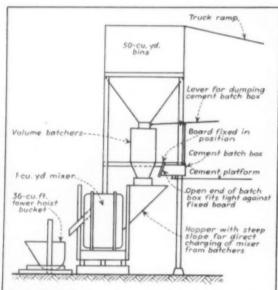








TWO CENTRAL PLANTS equipped with mixers and hoist towers produce 30,000 cu.yd. of concrete for five tall apartment houses and garage. Scaffold bridges erected up to height of thirteen-story buildings connect central plants with apartment-house structures.



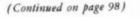
RAPID CHARGING of mixer directly from volume batchers and cement box increases concrete production. Sack cement is dumped into special batch box which is easily tilted to permit cement to flow through charging hopper simultaneously with sand and gravel.

with the sand and gravel through the steeply inclined hopper into the mixer drum in a few seconds.

A 36-cu.ft, tower bucket operated by a gasoline hoist engine raised concrete from the mixer to a 2-cu.yd. tower hopper built to the contractor's order and equipped with two gates from which concrete could be drawn off simultaneously into carts. All concrete was wheeled from the tower hoppers in 6-cu.ft, carts.

Scaffold Bridge—Timber pole scaffolds 320 ft. and 120 ft, in length connected the hoist towers with the buildings served by the two plants. As construction of the buildings progressed, the scaffold bridges were raised to a maximum height of 14 tiers, or 128 ft. Scaffold bents made up of 4x6-in. posts were spaced 10 ft., c. to c., and each third bent was guyed to deadmen to resist wind pressure on the scaffold.

Guys were attached at five elevations as the height of the scaffold increased. Where deadmen could



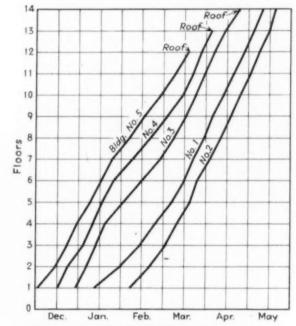
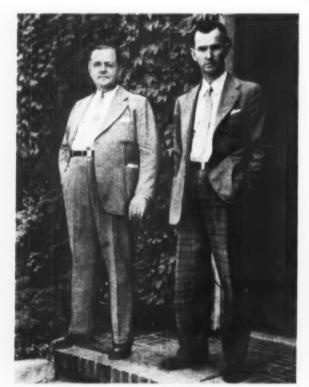


CHART OF ACTUAL PROGRESS reveals rapid reinforced-concrete construction during severe winter weather. All buildings are equipped with two sets of floor forms, with exception of units No. 1 and No. 2, which have only one set of forms during early lag in progress curves. After second set of forms is added to each of these buildings, construction accelerates noticeably.



CONSTRUCTION MANAGERS (left) for owner and for concrete contractor are EVERETT WINTERS (left), supervisor, representing Dr. Charles V. Paterno, and E. G. ROBBINS, superintendent, Walter Kidde Constructors, Inc.

REINFORCED-CONCRETE GARAGE erected on steep rock slope below level of apartment houses provides club facilities, including 15-ft. dining terrace supported by deep cantilever beams.

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GIANT FLOATING PILEDRIVER



Has Extensible Pendulum Leads

SLIDING LEADS (right) traveling in pendulum leads can be raised 60 ft. above top of tower and can be lowered to depth of 95 ft. below deck.

16-TON STEAM HAMMER (left), entirely inclosed for underwater driving, contains 7-ton ram operating on 32-in. stroke to develop blow of 37,500 ft.-lb.

O DRIVE 175-FT. STEEL H-PILES in water 70 ft, deep for the foundations of the Potomac River bridge between Maryland and Virginia at Ludlow Ferry, Md., the Merritt-Chapman & Scott Corp., New York City, holder of a \$2,000,000 contract for the substructure, built the world's largest floating piledriver, mounting a 90-ft. allwelded steel tower on the fore end of a steam derrick boat to carry extensible pendulum leads. The leads are designed to accommodate the heaviest single-acting steam hammer ever manufactured, a 16-ton unit equipped with a 7-ton ram which falls a distance of 32 in. to deliver a blow of 37,500 ft.-lb. Sliding leads mounted in the pendulum leads can be raised 60 ft, above the top of the tower and can be lowered 95 ft. below the deck. To drive batter piles, the pendulum leads can be tipped to a maximum inclination of 1 to 4 at either side of the tower.

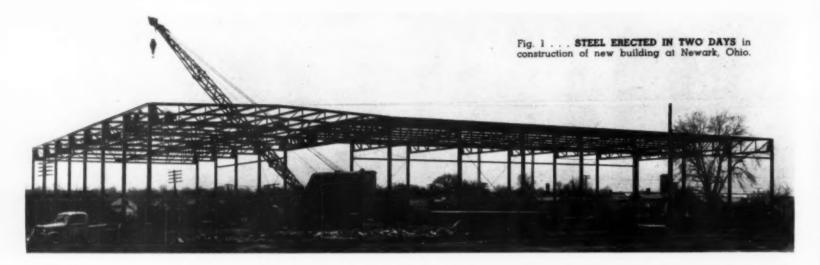
A five-drum deck engine operates the lines which control all movements of the piledriving equipment. Two lines from the engine, reeved through fall blocks attached to side arms at the fore end of the hull, incline the pendulum leads to port and starboard. The three remaining lines are used, respectively, to raise and lower the sliding leads, to control the position of the hammer and to pick up piles. At the top of the tower, these

MASSIVE ALL-WELDED STEEL PILEDRIVER mounted on steam derrick boat consists of 90-ft. tower carrying extensible pendulum leads which can be inclined to drive piles on 1 to 4 batter.

three lines pass over sheaves which are designed to move sideways as the pendulum leads are rotated, keeping the tower sheaves in line with a second set of sheaves mounted in front of them in the pendulum leads. From the sheaves in the pendulum leads, the lines are reeved through double sets of sheaves, situated about 60 ft. apart in the sliding leads, in a manner designed to assure free running of the lines in all positions and under all operating conditions.

Weight of the steel tower supporting the leads is 51 tons; the pendulum leads and extensible leads weigh about 25 tons each. All structural elements of the piledriving rig were fabricated and assembled by electric welding at the contractor's Staten Island yard in lower New York Bay. The special steam hammer, built by the McKiernan-Terry Corp. on order from the contractor to meet engineers' specifications for the bridge job, is completely inclosed for underwater driving.

Overall dimensions of the hammer are 3x3 ft. by 14 ft. high, including the driving cap. The 7-ton ram operates in a cylinder of 20-in. diameter under 100-lb. steam pressure and delivers 55 to 60 blows per minute. A 90-hp. boiler is required to operate the hammer. To avert possibility of emergency shutdowns on the job, the contractor has ordered a duplicate hammer to be held in reserve.



ARC-WELDING

Saves 20 Per Cent Weight of Trusses for Factory

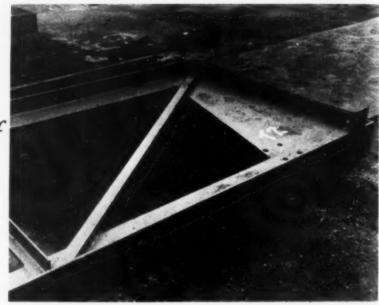


Fig. 2 . . . CLOSE-UP OF TRUSS showing details of electric arcwelding.

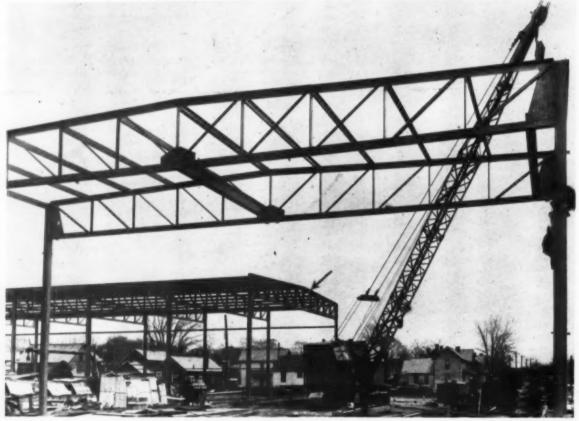


Fig. 3 . . . LARGE TRUSS, indicated by arrow, carries crane and two trusses of other wing.

NOVEL METHOD of construction in which wide-flanged beams support crane tracks and also serve as bottom-chord struts for structural stiffening, was noted recently in erecting a new building for the Charles E. Schular Engineering Co., at Newark, Ohio. These dual-purpose beams, in addition to all of the structural steel for the building, were fabricated at the site by electric arc-welding.

The new building, which is 126 ft. long, with an inside clear span of 50 ft. and inside clear height of 18 ft. 6 in., was constructed to fabricate and galvanize all types of light steel structures such as sub-stations, transmission towers, radio radiators, fire towers and flood-light beacon towers. Because of the shipping and manufacturing problems involved, the building was arranged in an L-shape, with a railroad siding running through one wing of the structure.

At first glance, (Fig. 1) the structural steel framework appears to be of the conventional mill-building type. The parallel chord Pratt type trusses, however, are completely welded, (Fig. 2), and support a 40-lb.-per-sq.-ft, roof-load and a crane load of 5 tons. The top and bottom chords are made by splitting a wide-flanged beam. The web system consists of angles welded to the webs of the tees, thus eliminating gusset plates. To reinforce the column connections and to eliminate kneebraces, 1/4-in. plates were welded to the top and bottom chords at the ends.

The weight of these trusses is approximately 2,000 lb. each. A comparison of the welded truss of this type with one of riveted construction shows a saving of 20 per cent in weight for the welded truss. In Fig. 3 can be seen a large truss at the junction of the two wings of the building. This truss supports two other trusses and carries part of the load of both cranes. The purlins are



(Continued on page 94)



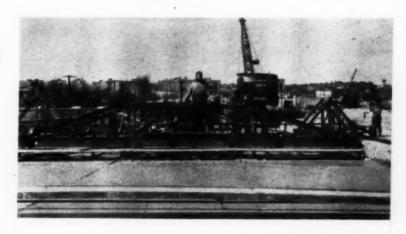
Fig. 5 . . . SPECIAL JIG aids fabrication of all trusses.



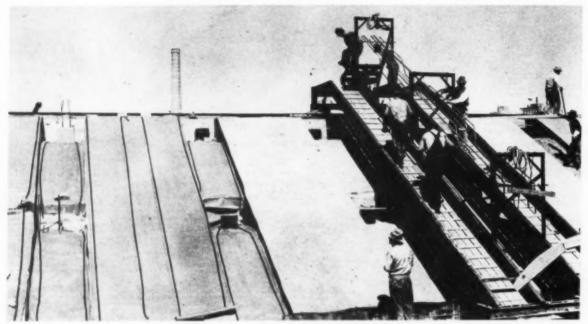
Fig. 6 . . . GALVANIZING KETTLE fabricated by arc-welding on the job.

THREE-LANE PAVEMENT

Finished in One Pass



INISHING THREE LANES SIMULTANE-OUSLY is accomplished by this Heltzel machine, which covers the entire 32-ft. width of one of two divided concrete roadways on viaduct approach to Meeker Ave. bridge over Newtown Creek, Brooklyn, N. Y. Contractor on this part of the job is the Elmhurst Contracting Co., of Elmhurst, Long Island, N. Y.



PREPARATION OF SLOPE for concreting included covering earth surface with reinforced kraft paper and placing steel reinforcement from traveling bridge.

OUNDED ON creosoted southern pine piles, a concrete-paved seawall 2 mi, long now protects the waterfront of Corpus Christi, Tex., from inundation by high waves and tides. The structure of reinforced concrete is of the stepped type, 151/2 ft. high, with a minimum slab thickness of 12 in. From the toe of the wall, 4 ft. wide and 31/2 ft. high, rise 12 steps, each with a tread of 1 ft. 9 in, and a rise of 1 ft, A continuous line of steel sheetpiling is driven to stable material along the toe of the wall and embedded 11/2 ft. in the concrete, thus forming a tight cutoff. Bearing piles which support the weight of the wall are creosoted southern pine.

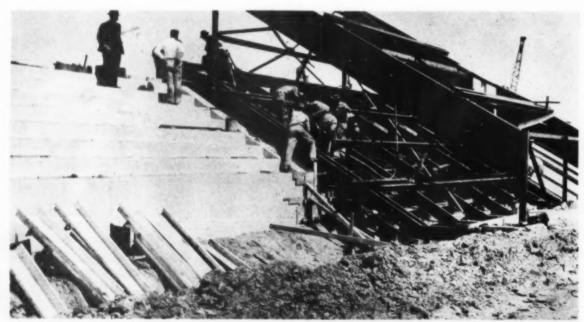
To permit the toe of the wall to

STEPPED SEAWALL

Built With
Traveling Forms

STEEL REINFORCEMENT is in place on sloping bank of seawall, ready for concreting.

Photos, American Wood Preservers Assoc



TRAVELING FORMS expedite the pouring of concrete for stepped seawall 2 mi. long at Corpus Christi, Texas.

be poured in the dry, the entire area is filled to a height of from 2 to 3 ft. and a dike from 15 to 20 ft. high thrown up outside the wall. The toe trench then is excavated, the sheetpiles driven and the fill on which the wall rests carried to grade, sloped and covered with reinforced kraft paper or fibre board. The concrete slab then is poured on this surface. The accompanying illustrations indicate the methods and the equipment employed in preparing the sloped surface and pouring the concrete to form the steps of the structure with the aid of traveling forms.

The contractor for the seawall project was J. De Puy, of San Antonio, whose operations were carried out under the direction of J. C. Bissett, city engineer of Corpus Christi. Myers & Noyes, of Dallas, acted as consulting engineers.

Present and Accounted For



IOHN M. CARMODY. appointed by the President to serve as administrator of the new Federal Works Agency created by the Reorganization Act of 1939, heads the world's largest engineering-construction organization. Under his jurisdiction are the following five Government bodies: (1) Public Roads Administration; (2) Public Buildings Administration; (3) U. S. Housing Authority; (4) Public Works Administration; and (5) Works Projects Administration. Prior to serving as Rural Electrification Administrator and as a member of the National Labor Relations Board, Mr. Carmody was editor of "Coal Age" and "Factory and Industrial Management," both McGraw-Hill publications.

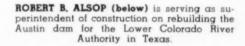


BRIGADIER-GENERAL MAX C. TYLER. Corps of Engineers, U. S. Army, is the new president of the Mississippi River Commission, succeeding Brig.-Gen. Harley B. Ferguson, retired. General Tyler has been serving since 1936 as assistant Chief of Engineers.

A Page of PERSONALITIES



A. N. SEVERIN, member of firm of N. P. Severin Co., of Chicago, arrives in Seattle, Wash., to direct construction of the new Federal court house in that city for which his company holds a \$1,214,000 contract. Among notable Government structures erected by the Severin organization on the Pacific Coast are the U. S. Marine Hospital at Seattle, the Veterans Hospital at Portland, Ore., and the Territorial Building at Juneau, Alaska.







E. E. ASHLOCK, general superintendent for Prado Constructors, heads the field organization which is building Prado dam, U. S. Engineer Department project on the Santa Ana River, near Corona, Calif. Contractors' organization represents a consolidation of following firms: W. E. Callahan Construction Co., Guthrie-Marsch-Peterson Co., J. P. Shirley and George W. Condon Co.



MARTHA S. RUBEY. of Boise, Idaho, doesn't believe that woman's place is in the home. She prefers the activity of a construction setting. Until recently manager of the Idaho Branch of the Associated General Contractors of America, she has resigned that post to become office manager for H. E. Cornell, contractor, of Boise, and member of the A.G.C.

CONSTRUCTION EQUIPMENT NEWS

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Review of Construction Machinery and Materials for SEPTEMBER 1939

IMPROVED TYPE OF BACKFILLER (right) offers to users, according to its manufacturers, 57 per cent increase in power, greater ease of operation and greater adaptability for wider range of services. In addition to backfilling, machine can be used for lifting, pulling, pushing, handling pipes and drum hoist applications. Three-speed transmission available, both for handling heavy or light materials and for travel. Equipped with telescopic boom of latticed construction with swinging radius of 180 deg., and adjustable between 21 and 31 ft, with increments of 18 in. Gasoline motor, 55-hp., enables machine to handle scrapers up to 7-ft, width. As crawier crane it is caid to carry loads up to 12,000 lb. at distance of 6 ft. from crawlers without undue tipping strain. In winter it may be used to handle snow.—Harnischfeger Corp., Milwaukee, Wis.



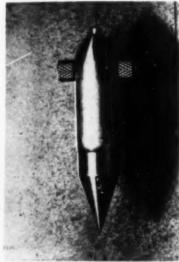




CONCRETE RECEIVING BUCKET, designed for use on concrete placement jobs having hoisting equipment, lies flat on ground and low enough so that entire truck-mixer batch can be deposited into it. Upon being picked up with bail, bucket rights itself in position to discharge through narrow radial gate at bottom of bucket — particularly convenient in pouring columns or exterior walls. Once hoisted, Ready-Mix Receiving Bucket, as it is called, may be moved to any position and emptied at exact spot. In pouring thick slabs it is one-man operated, but most hand spreading can be eliminated on thin slabs by having bucket swing while pouring by two or more men. — Insley Mtg. Co., Indianapolis. Ind.

BANK SLOPER (below) shown in vertical working position trimming bank, 350 ft. long and 35 ft. high, consisting of 11-ft.-thick layers of sand, of hard clay and of loam. Material to be sloped from bank ranges in thickness from 4 in. to 2 ft. It is reported that 12,250 sq.ft. was sloped in 8 hr. Machine said to be able to slope from vertical to approxi-





PLUMB-BOB (abeve), known as Jiffy-Bob, has two advantages, according to its makers: (1) Cord winds up inside bob, doing away with bulky cord usually wound up on wooden spool or piece of stick; (2) length of plumb-bob cord may be adjusted from 0 to 8 ft. by winding or unwinding cord and then tightening two knurled nuts which lock cord in any desired position. Recommended to ironworkers, carpenters, masons, building construction and maintenance men. Retails for less than 50 cents. — J. A. Honneyer & Associates. 223 Spruce St., Bloomfield. N. J.

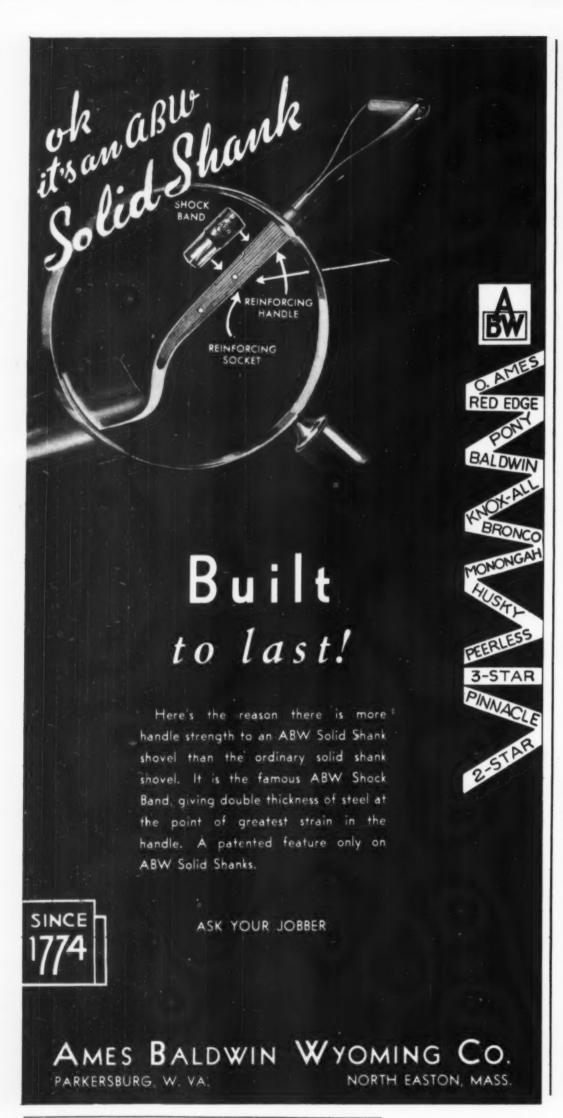
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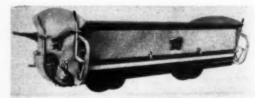
FOR FLOODLIGHTING CONSTRUCTION PROJECTS, sports areas, service stations, industrial yards and similar places new floodlight has been designed, using 750-, 1,000- or 1,500-watt lamps. Feature: optional cover glass allowing easy access is swivelled at top of reflector and held by nickel-plated, copperalloy ring. Three easily operated stainless-steel clamps hold cover in place. Cast-aluminum hood insures weather-tight joining. Maximum light output assured by use of vertical-burning lamps and Alzak-processed aluminum reflectors. Wide range of beam spreads possible by employing polished, narrow-



beam reflector or diffusing wide-beam reflector, plain or diffuse lens; and clear or inside frosted lamps. Lenses are high-transmission, heat-resisting glass. Skeleton screwbase sockets with nickel-plated metal parts and spring phosphor-bronze center lamp contact. Construction of reflector base and bracket permits wiring without handling reflector which can be removed and reinstalled without refocusing. Castaluminum socket extension attached to reflector by four heavy bolts making watertight seal.—Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

READY-MIXED ALUMINUM PAINT for interior and exterior painting that requires no special mixing and can be applied directly from container is a combination of 99.5 per cent Gilsonite asphalt, special Valdura processed tung oil base and fine aluminum paste. Besides being faster and more convenient to use, ready-to-use paint obviates trouble of mixing enough paste and vehicle for only a day's painting. Saves time and bother of stirring paste into vehicle and prevents use of paste and vehicle in improper proportion.—American Asphalt Paint Co., 43 E. Ohio St., Chicago, Ill.

EASY WORKING CRANK CONTROL for surface material spreader, said to make this unit even more efficient, regulates height of coupling by which spreader is attached to truck and allows distribution of every load of material with box riding level. Operator swings coupling exactly in line with hitch on truck frame regardless of unevenness of ground. Location of crank handles on end of spreader box places operator in safe position when truck is being backed up. Another feature of



spreader, said to aid accurate and uniform distribution of material from mere sprinkle up to 60 lb. per square yard, is fluted feed roll that controls flow and operates in direct relation to speed of truck with choice of speed ratios afforded by interchangeable drive sprockets. Same accuracy holds either for forward or "back-up" spreading because feed roll is driven through a reversible transmission.—

Buckeye Traction Ditcher Co., Findlay, Ohio.



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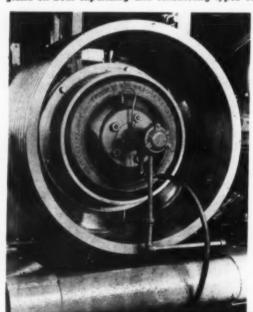


hydraulic inspection's JACK specially designed for track inspection work is small, compact unit weighing only 20½ lb. complete with 20-in. lever. Makers claim that one man using this jack can do work of two men handling larger mechanical jacks, as weight on end of lever necessary to lift average rail is 39 lb. To provide grip on rails, jack is equipped with grooves at top for lining rail laterally and also has sturdy toe lift for raising track and



ties to correct height or to facilitate tie and ballast maintenance. Round base permits firm grip on any type of surface. Another advantage: Top rail grooves at angle allow working handle to swing in full arc completely clear of obstruction from other jack parts or tracks. Inspector's jack has full rise of 6½ in. and low overall height of 11 in. Total height when raised, 17½ in. Top of toe lift 2 in. above bottom of jack. — The Buda Co., Harvey, III.

RUBBER CLUTCHES for industrial purposes, such as machine tools, conveyors and diesel electric generators are said to be replacing multiple disk and other plate clutches for following reasons: (1) longer life; (2) much simpler — has three or four parts as compared with 75 or 100 pieces in conventional clutch; (3) self-adjusting; (4) provides uniform pressure on every inch of surface, while pressure exerted by plate-type clutch varies when plate becomes warped; (5) capacity of Airflex clutch regulated by internal pressure; that of other clutches fixed. Adhesion of rubber clutches obtained through friction liners riveted to brass plates vulcanized to clutch gland on both expanding and constricting types of



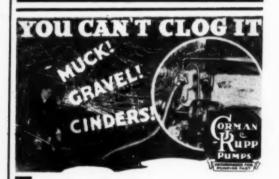
clutch. Two types of lining used (1) friction lining where excessive slippage is encountered and where loads are to be picked up gradually; (2) plain rubber squeegee tread where reasonable amount of slippage can be tolerated if engagements are not too frequent. Clutches given special treatment to prevent disintegration by oil fumes. Special rotary seal developed to deliver air to clutch, either by entering shaft at end or by straddle-type seal. Largest clutch made up to this time is 40-in. used on marine engine applications with 3,000-hp. capacity.—Fawick General Co., c/e General Tire & Rubber Co., Milwaukee, Wis.

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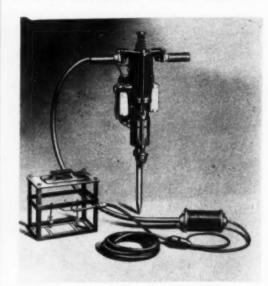
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tached to hammer by 5 ft. of cable. Position of coil makes it possible to place wet battery in any convenient location, providing hammer operator maximum freedom. Ventilated steel battery box which will accommodate almost any 110-amp. 6-v. battery supplied.— Barco Mfg. Co., 1815 Winnomac Ave., Chicago, Ill.

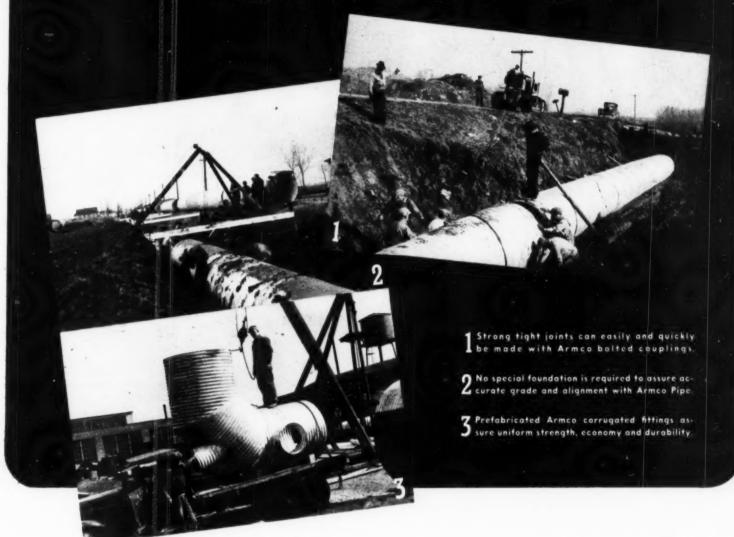
HYDRAULIC TRACTOR SHOVELS, high speed units for use on digging, hauling and material loading operations, are built around International tractors modified especially for this type of service. These modifications include special long tracks, six-roller truck frames, spring loaded foot clutch, double steering clutches and reverse radiator fan. Bucket 34-yd. capacity, raises about 9 ft. in 11 sec. and has maximum dumping clearance of 7 ft. It is raised, lowered or held at any desired height by



control handle and dumped by trip lever. Heavy, structural steel frame; cast steel sheaves with bronze bearings and pressure grease fittings; cables, 7/16 in. diameter; rotary gear-type pump direct connected to engine crankshaft through self-aligning coupling, said to operate under 1,000 lb. constant working pressure. Weight, 4,400 lb. Extra equipment, backfiller blade, 36x84½ in. with high carbon cutting edge; snow bucket, 1-yd. capacity.—The Frank G. Hough Co., 919 N. Michigan Ave., Chicago, Ill.

PORTABLE SCAFFOLD, called "Scafol-Car," said to meet need for safe, practical unit of this type, is recommended to contractors doing plastering, painting, electric wiring, overhead piping of sprinkler systems and kindred types of work. Self-moving as well as self-raising and lowering. Workmen roll "Scafol-Car" to job, place tools and equipment on platform, and lift and lower themselves to proper height by turning crank. Without getting off scaffold they also can move themselves forward or





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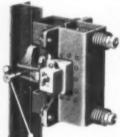


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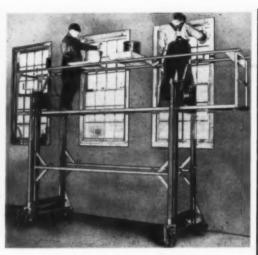
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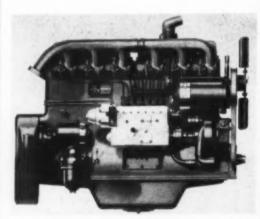
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Or Ask Your Equipment Distributor

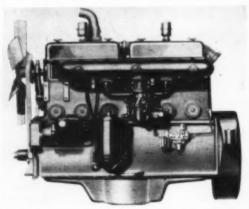


backward with load by operating driving crank that propels bottom driving wheel. Affords protection not only to workmen but to pedestrians who might be injured by falling tools and materials. Model No. 16 for 16-ft. ceiling maximum has overall height, lowered, 6 ft. 5 in.; fully elevated, 12 ft. 2 in. Speed, elevating, 2 ft. per minute; lowering platform, 4 ft. per minute. Traveling speed, 30 ft. per minute. Load capacity 1,500 lb. Quickly collapsible, requiring only 16 sq. ft. of storage space.—Economy Baler Co., Dept. C., Ann Arbor, Mich.

MULTI-FUEL, POLY-CYCLE ENGINE for truck and bus service said to be convertible after manufacture for use either with oil, gasoline, butane, or producer or natural gas by simple change of fuel burning accessories. Advantages claimed for these engines are greatly reduced service and maintenance costs because of ready interchangeability of service



parts between gasoline and oil engines and large quantity production. Photo shows first of series of six-cylinder truck engines with 525-cu.in. displacement. Engine has six cylinders 4½x5½ In. with 3-in. seven bearing crankshaft and output of 125 hp. at 2,100 r.p.m. When built as gasoline engine, elbow air horn on intake side is replaced with carburetor. Injection equipment on opposite side of



engine is omitted and instead of fuel nozzles are inserted screw plugs of equivalent volume so that compression ratio of 5.8:1 is maintained. Fuel economies of .5 lb. per horsepower hour on diesel oil and slightly better ratings on gasoline are claimed. Weight as oil engine said to be only few pounds greater than weight as gasoline engine.—Waukesha Motor Co., Waukesha, Wis.



All Steel DERRICKS

Guarantee Safety

When you guarantee



safety, you economize for safety means uninterrupted operation and lowest possible maintenance costs.

And DOBBIE All-Steel Derricks have been de-

And DOBBIE All-Steel Derricks have been designed for safety and consequent economy. They have a safe load capacity of almost twice their rating. You need this assurance of dependable safety and continuous performance.

SAVE POWER BY USING BALL OR ROLLER BEARING FOOTBLOCKS AND SHEAVES. Built in both Guy and Stiff-leg types. Write for information and prices.

Dobbie Foundry & Machine Co.

Other Dobbie Products—Steel Derricks, Timber Derrick Fittings, Hand Winches, Motor Driven Winches, Blocks, Sheaves, etc.

Want Daytime Efficiency on that Night Job?



NATIONAL CARBIDE CORP. LINCOLN BUILDING . NEW YORK

Send information on lanterns or V-G Lights

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11 MODELS IN FOUR SIZES

TWO 3/8 YD. MODELS

Bearcat Jr. . . . 15,000 lbs. Model 55 . . . 25,000 lbs.

TWO 1/2 YD. MODELS

Model 60 . . . 28,400 lbs.

Model 65 . . . 30,000 lbs.

ONE 58 YD. MODEL

Model 75 . . . 32,000 lbs.

TWO 3 4 YD. MODELS

Model 83 . . . 36,000 lbs.

Model 80 . . . 48,000 lbs.

ALSO FOUR TRUCK CRANES
AND SHOVELS

Gas or Diesel Power

He's not a channel swimmer

BUT HE'S AT HOME IN DEEP WATER

● The deep sea diver may never win medals for distance or speed swimming, but he's at home in the water. For years he has specialized in deep diving . . . and in his range of work he's "tops."

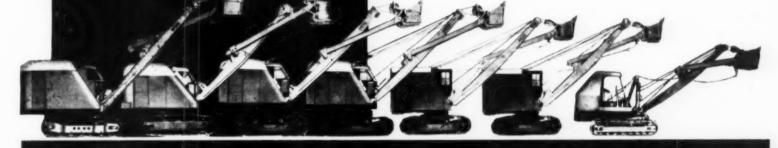
Like the deep sea diver, Byers specializes in its field.

Byers builds power shovels and cranes, specializing in the $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ yd. range . . . the portable sizes. In these four sizes, Byers builds 11 models from which you can choose the correct machine for types of work in which you specialize. You'll be farther ahead at the end of the day . . . or year . . . with a Byers.

Why? Because a Byers swings faster, digs faster, dumps faster. It keeps everlastingly at it. Smooth operation, accurate control, ample power to hoist, crowd, swing or travel... these advantages mean much to the man who makes his living in the contracting business.

Remember, too, that Byers shovels and cranes are delivered complete . . . complete with electric starter, automatic dipper trip, two speed crawlers, independent chain or cable crowd . . . complete, ready and able to give you and your operator every chance to make maximum output on every job.

Why not inquire about Byers shovels and cranes today?



SHOVELS · CRANES · DRAGLINES · TRENCH HOES

THE BYERS MACHINE CO., RAVENNA, O. Distributors throughout the World

SPECIALIZING IN 3/8 · 1/2 · 5/8 · 3/4 YD. MODELS



MODEL P.A PLANTS ARE BUILT IN 4 SIZES

MODEL PA-15 1500 = Mixer

MODEL PA-20 2000 = Mixer

MODEL PA-30 3000 = Mixer MODEL PA-40 4000 = Mixer

A NEW PORTABLE ASPHALT PLANT

in completely assembled sectional units easily moved by truck

or rail and quickly erected without the use of a crane or gin pole.

Patents applied for

Built in 4 Sizes

Write for Bulletin T-260

HETHERINGTON & BERNER, INC.

701-745 Kentucky Avenue

Indianapolis, Ind.

A tricky fight manager once stuffed a lot of horse-

CLEVELAND, OHIO

Cranes Take Fast, Hefty Swings with a Williams Bucket on the Boom!

* Cranes have limits in lifting power and digging radius. Hanging TOO big a bucket on the boom often defeats its own purpose!

You want FAST digging, and BIG payloads - and Williams Buckets help you get the best performance from your cranes because Williams welded construction

and design eliminate excess weight without sacrificing digging power or durability! You get the most out of your cranes with the right Williams **Bucket** on

the boom or dragline!

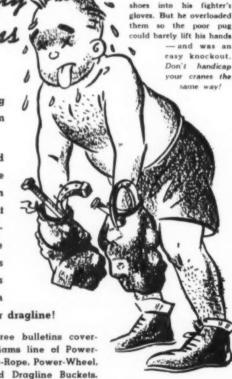
7017 CENTRAL AVE.

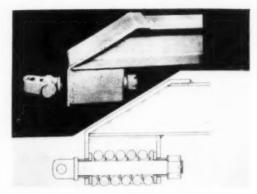
Send for free bulletins covering the Williams line of Power-Arm. Multiple-Rope. Power-Wheel, Hook-On and Dragline Buckets.

THE WELLMAN ENGINEERING CO.

WILLIAMS Buckets built by WELLMA

them so the poor pug could barely lift his hands - and was an easy knockout. handicap your cranes the Distributors located in all parts of the country for prompt





NEWLY DESIGNED HITCH for Blaw-Knox sheeps-loot tamping rollers functions in both directions instead of in forward directions in both directions in-stead of in forward direction only, thereby reducing impact and shock loads when tractor is moving for-ward or backing up. Double action is made pos-sible by special mounting of spring.—Blaw-Knox Co., Pittsburgh. Pa.

ALL-PURPOSE SAFETY SHIELD for minimizing hazards to eyes and face is made of synthetic transparent material which gives operator unobstructed view of job in hand. Dependon Safety Shield is attached to adjustable headband by friction swivel joints which permit raising entirely out of way when not in use. Said to withstand heat, sparks and acids. Far enough removed from face to allow proper



ventilation and wearing of prescription glasses of goggles. Shields are either clear or tinted and are goggles. Shields are either clear or linted and are made in various depths from forehead to chin. Recommended for use in grinding and chipping operations, work with acids or hot liquids, plating, degreasing, old paint or scale and for acetylene and spot welders.—Sellstrom Manufacturing Co., 615 N. Aberdeen St., Chicago, Ill.

FOUR-WHEEL-DRIVE TRUCK with snow plow equipment and fitted with Philos one-way radio last winter saved the life of a woman living in Brown County, Wis., who was critically ill and whose home was isolated by heavy snowdrifts. The doctor received a telephone message asking for help, but was unable to reach the sick woman until George J. Cormier, highway commissioner of Brown County, got in touch with the police department and asked



them to instruct the nearest snowplow truck to open the closed road from the main highway. Mr. Cormier has all snow plow trucks equipped with one-way radio systems for the purpose of directing them from his Green Bay office. Each truck in the fleet has its own number by which it is called from police headquarters. Truck drivers upon call either report by telephone to Mr. Cormier for instructions or receive orders directly by radio.—The Autocar Co., Ardmore, Pa.

WATCHDOG TURNS

WOLF_

Bearings eaten by the oil that should have protected them!

N a Middle-Western city, a Diesel operator found that the modern alloy bearings in his Diesels were becoming pitted and corroded.

"Why?" asked the owner.

Investigation proved that the etching was caused by the formation of acids in the lubricating oil. The oil that should have protected the bearings was actually eating them away!

According to theories advanced to the operator, this condition was inescapable. Any oil would do the same. High speed, high temperature and extreme pressure were overpowering factors.

But when the oil was replaced with Shell Talpa Oil, no further etching took place!

AN ISOLATED INSTANCE? Far from it! For hundreds of Talpa-lubricated Diesels are running constantly without the slightest sign of bearing trouble.

Shell Talpa Oil has achieved this amazing record because it is made to resist oxidation and acid formation; because it does not



SHELL TALPA OIL PROTECTS
THESE BEARING METALS:

Hardened lead · Cadmium nickel

Cadmium silver · Copper lead

Lead bronze · Babbitt

break down easily; because it maintains its viscosity, provides the dependable lubrication so necessary in modern high-speed, high-pressure Diesel operation.

Call your nearest Shell office today.



SHELL TALPA OILS

INCREASE DRAGLINE YARDAGE WITH A PAGE AUTOMATIC BUCKET



A bucket for every machine and job, — Capacities from 3/8 to 15 cubic yards.

Because Page automatic buckets with their patented rounded front design use all their weight most effectively for digging, they have the reputation of being able to outdig other type buckets of equal size and weight.

You can increase your dragline yardage and profits with a Page Automatic. See your equipment dealer or write direct to us for more information.

DIG WITH A PAGE AUTOMATIC!

PAGE ENGINEERING CO

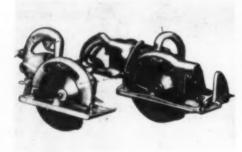
CLEARING POST OFFICE



2-CU.YD. POWER SHOVEL. convertible for use as dragline, clamshell or crane, and available with gasoline, diesel or electric power, has new type of chain crowd said to provide powerful crowd-out and high speed retract saving time on every digging cycle. Crowd, hoist and swing synchronized to give maximum output. Light, strong front end claimed to afford user wide working ranges and big sheaves to increase rope life and provide favorable digging angles. Dipper has short back, curved door and smooth inside flaring outward to bottom to assure fast, clean dumping action. Equipped with inserted Beco Tiger Teeth, reversible and replaceable.—Bucyrus-Erie Co., South Milwaukee, Wis.



LIGHT-WEIGHT LOADER built to fit needs and budgets of smaller cities and highway units weighs about 13,000 lb. and sells for \$6,850, f.o.b. Franklin, Pa. PL-10 general utility model, developed for rapid and efficient loading of diverse materials such as snow and ice, ashes, coal or cinders, is gasoline-driven, self-propelling and self-feeding machine of inclined conveyor type with patented Joy gathering mechanism. Operated by one driver from cab on left side of conveyor, immediately above gathering head. Designed to load snow and ice into trucks at rate of 10 cu.yd. per minute, depending upon condition of material. Speed while loading, 1½ m.p.h.; traveling speed, as high as 35 m.p.h.—Joy Manufacturing Co., Franklin, Pa.



PORTABLE ELECTRIC HANDSAW, one shown at left with cutting capacity of 2½ in. and other with capacity of 3½ in. on straight cuts. Each has heattreated aluminum tilting base for bevel cuts up to 45-deg. angles; new, improved more powerful motor and patented approved safety guard. Other features: Extra large gears, and pinions, aluminum alloy castings and special blower that clears cutting line and keeps sawdust from getting into eyes of operator.—Mall Tool Co., 7740 S. Chicago Ave., Chicago, Ill.

Another ADNOUN TRADE MARK REGISTERED FOR Allied Bituminous Products, Inc.

Kokomo Ind.

AFTER

trial of another make of Black Top paver, Allied Bituminous Products, Inc., Kokomo, Indiana, bought their second Adnun. Here again Adnun superiority has been demonstrated and measured in terms of economical performance and smooth, troublefree operation.

Adnuns are built to lay better Black Top roads-Hydraulic Controls, Continuous Course Correction, Power Cut-off, and many other features play a large part in faster paving at lower cost. And Adnuns will stand the gaff of hard usage, year after year—Work won't shake an Adnun apart.

Repeat orders are your assurance that you'll save time and money in the long run with the Adnun Black Top Paver. Investigate now.

THE FOOTE COMPANY, Inc., Nunda, New York

No other Bituminous Paver gives this combination of advantages

- Breaker bar that gives you pug mill action reducing waste of materials.
- · Hydraulic controls for better pavement.
- Continuous Course Correction for smoother pavements.
- · Power Cut-off-no tagend run outs.
- Overlapping cutter bar action—tight joints un-
- Sturdy construction that stands up in service.
- Capacity to over 1000

MULTIFOOTE CONCRETE PAVERS AND ADNUN FINISH SPREADERS

September, 1939—CONSTRUCTION Methods and Equipment—Page 81

-5

The Insley Shoulder Finisher is the most effective and economical equipment available for grading and finishing to accurate lines, the shoulder and backslope on roadpaving jobs. It has repeatedly proved that it can grade

and finish both sides of a mile roadway in a day...in one operation.

Two men operate the Insley Shoulder Finisher which is pulled by either a light tractor or 5-ton truck. Expensive and inaccurate hand labor is eliminated. Available in two different types with blades capable of finishing shoulders from 5 ft. to 11 ft. wide.

Insley Manufacturing Corporation, Indianapolis, Indiana

Grade and Finish

AMILE A DAY

Roth sides of the Road
IN ONE OPERATION



There's a SIMPLEX for Every Construction Need.

For every construction job calling for jacks there's a Simplex Jack to do the job faster, safer, easier and at a lower cost—and lots of jobs where you don't ordinarily use jacks can be done better with Simplex Jacks.

Building, raising, lowering or moving; bridgework, sunken highway slab raising, concrete form leveling, temporary adjustable supporting and hundreds of other construction and equipment maintenance jobs demand the use of Simplex Jacks for real economy and efficiency. Every one accurately tested and guaranteed to lift its full rated capacity.

Over 217 models for every requirement.

Engineering -

Building -

Sewer and Water-

Tunnel Roof Supports Cable Tensioning Screw Jacks Geared Jacks Pipe Pushers

Jacks
Post Pulling Jacks
Emergency Jacks
Automatic Lower-

ing Jacks

Journal Jacks
Timber Braces

Pipe Pullers
Trench and Timber
Braces

Shoring Jacks

Cable Reel Jacks

Sold by leading supply houses. Write for bulletin or special information.

TEMPLETON, KENLY & CO., Chicago, III.
Better, Safer Construction Jacks Since 1899

SIMPLEX
GOLD MEDAL AWARD SAFETY JACKS

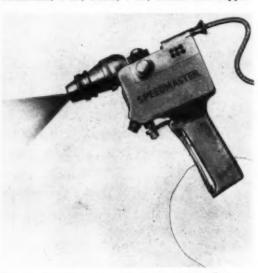


DOUBLE-DRUM CABLE CONTROL ATTACHMENT for track-type tractors to facilitate handling of cable-controlled scrapers, bulldozers and other earth-moving equipment, is mounted in such a way as to leave tractor drawbar clear, making easier hooking and unhooking. Also gives operator unobstructed view to rear. Better spooling is provided by increasing distance between drum and first bend in cable. Cable control levers conveniently located. Other fea-



tures: (1) Fairlead rolls adjustable to higher or lower positions and provided with removable bushings and pressure gun grease fittings; (2) control drums easily threaded without making sharp bends in cable; (3) yokes and through bolts provide frame around working parts, assuring alignment of parts and rigid support; (4) clutch adjustment nut readily accessible; (5) link pin and yoke only need be removed to slip out clutch.—Caterpillar Tractor Co., Peoria, Ill.

METAL SPRAY GUN is high-capacity unit designed to spray efficiently all metals that can be obtained in wire or rod form, as protection against destructive action of atmospheric and chemical corrosion. Weighing only 4½ lb., the Speedmaster gun has hourly capacities of applying the following metals: Aluminum, 8 lb.; steels, 9 lb.; bronze and copper



20 lb.; zinc, 40 lb.; lead, 80 lb. Mechanical features include extra heavy bronze gears; ball-bearing shafts; poppet-type valves, segregating gases, synchronized to operate by movement of single lever; one-piece wire nozzle; and wire feed mechanism of impulse type with curved bucket turbine and throttle control for variable speeds.—Master Metal Spray Co., 2527 Magnolia St., Oakland, Calif.

LEAK LOCATOR for detecting weak spots in water, oil, gas and other buried piping systems, consists of sectional probe capable of reaching depths dug by earth auger or similar tool. Uses vibration differentiation method of testing pipe lines for leaks. Vibration in pipe line caused by gas, steam, air, oil, water or other fluids escaping under pressure is resolved into two components: one, longitudinal, parallel to axis of pipe; other, transverse, normal to axis of pipe. Quantitative inspection of effect of selective damping with respect to frequency and relation between components furnishes indications from which source of vibrations can be determined and which are integrated with instrument itself.

(Continued on page 85)

Basically Different Lubricating Oil
Removes Carbon; has Stronger Natural Film

LION Naturalube

MOTOR OIL AND DIESEL ENGINE OIL

NEW TYPE OILS CUT OPERATING COSTS BY REMOVING HARD CARBON AND SAVING WEAR

Performance tests have convinced many contractors that Lion Naturalube cuts operating costs and insures longer periods of continuous, economical engine operation. Service records on all types of internal combustion engines prove that Naturalube's ability to gradually remove hard carbon deposits from pistons, rings, valves, and spark plugs conserves power and lowers fuel and maintenance costs.

tive laboratory wear tests 33 1/3% to 116% more wear occurred when using other type oils than when using Naturalube.

For longer periods of trouble-free engine operation at a savings switch to Lion Naturalube Motor Oil or Lion Naturalube Diesel Engine Oil.

> For visible and understandable proof of Naturalube's money-saving properties and details of money-back guarantee, phone the nearest Lion Naturalube distributor or write Lion Oil Refining Company, El Dorado, Arkansas.

Naturalube's stronger natural protective film is another money-saving feature. In compara-

LION OIL REFINING CO.

ARKANSAS



Why...

CONSTRUCTION Methods & Equipment

clicks with its readers

Engineer in charge of Department of Sewers, a Pennsylvania city:

I was a charter subscriber to Construction Methods and Equipment and I've been reading it ever since. My use of the paper is pretty thorough. The advertising is of intense interest to me. In this respect, Construction Methods and Equipment is of more importance to me than °°°. This publication is needed more than any other by construction engineers and construction men.

Service engineer of a Portland cement company:

The illustrations in Construction Methods and Equipment tell a story in themselves. This means much to me since I always view the illustrations even when I cannot find time to read all of the articles. The advertising is always studied as a means of keeping in touch with such construction equipment as we may not contact in our territory. The construction news equipment section for the same reason is always carefully followed.

A commissioner of public safety in a municipal water plant in Pennsylvania:

I go through each issue of Construction Methods and Equipment from cover to cover and very often find it to be helpful in the selection of equipment and materials. It is nicely prepared and easily read. Your use of photographs is such that they tell more than much copy could do. It makes this publication interesting to me whereas the highly technical engineering publication is not. Our department always follows the interesting jobs and discusses those that are comparable to our own conditions. Our departmental superintendent has a very efficient filing system for articles clipped from Construction Methods and Equipment.

A construction engineer for a state highway department:

I like Construction Methods and Equipment better than any other magazine. You can only get out of a magazine what is put into it and I am able to go over this magazine more thoroughly. I am very much interested in pictures and it seems as though picture reading is the vogue nowadays. A picture study of an operation or method is more lasting. Another chief interest to me is the advertising pages. Tied up in the office as I am most of the time, I can devote enough time to the advertisements to enable me to keep posted on equipment being used. It certainly is interesting to watch the progress that manufacturers are making.

Secretary-treasurer of a general building

There are so many magazines these days that the one that really counts is the one that catches your eye. Construction Methods and Equipment does the trick all right. It is well gotten up and gives me just what I want. A worthwhile idea is worth, not one year's subscription, but ten. The first things that I look for are "This Month's News Reel," "How They Did It," and "Job Oddities." Think all three are great. Needless to say, pictures make the magazine and your pictures are by no means the ordinary type.

In common with other McGraw-Hill publications, Construction Methods and Equipment has established a continuing program of editorial research which is conducted by a staff of specially trained inquirers. The members of this staff make personal calls on subscribers at work in the field and in their offices in all sections of the country—to question them as to their appraisal of Construction Methods and Equipment, how they use it, what they like best, what they pass up. On each visit a specific issue is gone through cover to cover and every page and every item weighted according to its value to the interviewed subscriber. An original and farsighted step in journalistic practice, the object of the plan is to help the editors gage the needs of subscribers so that a progressively better publishing service may be provided. These research visits in no way replace the vast field contacts of Construction Methods and Equipment's editors but augment them and draw out frank expressions that readers sometimes are reluctant to give to the editors themselves.

Believing that readers will benefit from a knowledge of what their collegues find of value in Construction Methods and Equipment, we are publishing a series of advertisements in each of which we quote interviewed

Assistant foreman for a general contractor in Illinois:

Frankly, there is nothing I might suggest along the improvement line. The magazine as it is now quite suits my taste. I like it particularly because it is fast-reading and the pictures are always good. I sometimes wonder how it is possible to get such fine pictures. The advertisements are good also and when it comes to heavy equipment such as derricks, tractors, trucks, etc., you sure have put them across. I get more out of the advertisements when they show pictures of what the equipment can do. This LeTourneau advertisement is exactly what I mean. The Caterpillar advertisements are along the same lines.

Partner in a contracting organization in Ohio:

I have pulled a lot of good things out of the advertising pages of Construction Methods and Equipment. Pumps and air filters, for instance. I am looking for new equipment and new ways of doing things when I read this magazine. I read every page of every issue for that reason. Anything on excavating and the equipment used is what I look for first of all. I am especially interested in labor and safety angles. I would like to see you start a campaign for uniformity of signals used on construction work. I have seen half a dozen different ones used when signalling to a crane operator.

Head of construction organization specialising in industrial building in Indiana:

I like the arrangement of the contents page telling the "how of it," very much. Always look this over very thoroughly. I watch the advertising closely as it always is introducing new ideas and equipment. Must say that you people know how to present it in a well arranged manner to catch the eye. I doubt very much if the pictures could be any better. They are unusually clear and interesting and to me one good picture is worth three pages of text, any time. The whole magazine is filled with ideas that are new. Whether they involve large and heavy projects, you can most always apply the very same methods to smaller jobs. I have bought a number of items of equipment as a result of seeing them advertised in Construction Methods and Equipmnt.

General superintendent for a paving contractor in Illinois:

I turn first to the "How of It." It is certainly a good feature. "Job Oddities" is another very good feature. It presents ideas that are worthwhile and that are money-savers. I have been able to apply to several jobs the ideas that I picked up from this feature. You have got real punch in your advertising pages and they, too, give me new ideas on how to do different jobs.

General manager of a construction company in New Jersey:

The advertising means as much to us as the rest of the paper, since keeping up with what is new in equipment is very important in our line of work. The new equipment section is a most valuable part of the paper to us. I have used the Searchlight Section both for the purchase and the sale of equipment.



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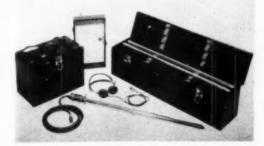
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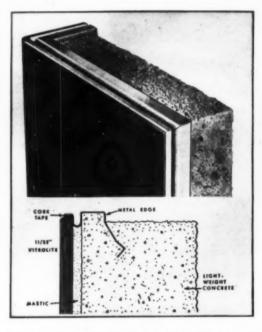
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showing on meter. Self-contained batteries will give from 250 to 300 hr. of intermittent service and tubes, minimum of 1,000 hr. Batteries, detection instruments, earphones and other auxiliary items inclosed in heavy-duty waterproof case. Electrical unit weight, 30 lb.—Western Instrument Co., Frelinghuysen Ave., Newark, N. J.

STRUCTURAL GLASS, called "Glastone," offered in wide range of colors for constructing buildings to any height is made by bonding vitrolite, an opaque colored glass facing, with haydite, a lightweight concrete, in such a manner that block can be used as load-bearing unit. Said to provide safety factor of 1½ to 2 above requirements of building codes and to have a strength of 1,500 to 2,000 lb. per square inch; to be moisture proof and resistant to heat and cold. Weight, 90 to 100 lb. per cubic



foot compared with 145 lb. per cubic foot for cast stone or similar masonry materials. Glastone comes in thicknesses of 4 and 8 in.; surface areas of units range up to 12 sq.ft. Installed like ordinary masonry units. Plaster may be applied directly to interior surface. New material, like other glass, said to have non-porous surface, and since it cannot absorb greases may be cleaned by soap and water even where atmosphere contains heavy deposits of oily or chemical substances. — Libbey-Owens-Ford Glass Co., Toledo, Ohio.

PIPE FOR SUBSURFACE DRAINAGE, known as Toncan Cor Wel, is of helically corrugated, rust-resisting metal with a heavy zinc coating, either perforated or non-perforated, and has a continuously welded longitudinal seam. Has nominal 6-in. inside diameter and is available in either 18- or 16-gage in any length up to 24 ft. Perforations are placed in inside crests of corrugations; six longi-





tion. Made entirely of tough wrought steel with drop-forged base, handle and jaws. Teeth are saw-tempered for file sharpening. A dependable tool on any construction job—big or little.

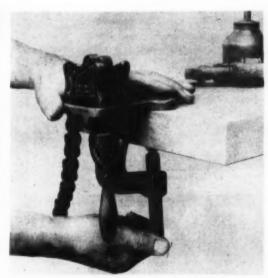
Supplied in 4 sizes, for pipe 1/8 to 8". Every "Vulcan" is fully guaranteed.

PORTABILITY?

..... and how!

"Vulcan" Clamp Kit Vise, the latest addition to Williams' line, is identical in design with "Vulcan" Vise No. 1, except that it has a clamp member, integral with the base. "Vulcan" Clamp Kit Vise can be readily and firmly attached to bench, post, truck platform, or other support, without the use of bolts or screws. Light in weight — only 5-¼ lbs. — easily carried. One size only for pipe, ½ to 2".

Ask your supplier, or write for illustrated literature.







AMERICAN 50 Ton Steel Stiffleg Derrick placing concrete aqueduct pipe 12 feet 8 inches in diameter and 12 feet long.

Present-day high-speed material handling calls for the absolute "tops" in derrick design and construction. The AMERICAN Line contains derricks built to meet every requirement — stiffleg, guy, self-supporting, tower, and barge types. Each is thoroughly engineered — designed and built to meet the exacting demands of present-day high-speed material handling.

WRITE DEPT C M

AMERICAN HOIST & DERRICK CO. SAINT PAUL, MINN.

AMERICAN TERRY DERRICK COMPANY SOUTH KEARNY, N. J.

Branch Offices

NEW YORK and CHICAGO

tudinal rows of holes are usually located in bottom of pipe. Sections of pipe are joined by connecting bands of simple design. Among advantages claimed are light weight combined with many times the strength of ordinary drainage pipe. Fittings of all types such as tees, ells, wyes, crosses and reducers are furnished either perforated or non-perforated.

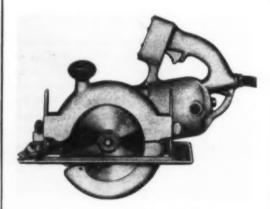
—Toncan Culvert Manufacturers' Association, Republic Building, Cleveland, Ohio.

WATER-COOLED ELECTRIC A. C. GENERATING PLANTS, 1,500-watt capacity, equipped to operate on gasoline, natural or manufactured gas, may be had in manual, self-starting or full automatic types, with control systems provided to start plant in case of failure of power line. Particularly useful for installation in public buildings, private business quarters and homes when other electric lighting facilities fail because of floods, tornadoes and storms. Plant and controls inclosed in metal housing which pro-



tects unit from weather conditions and eliminates sound while running, thus making plant suitable for installation in any surroundings. Cooling system consists of direct-connected pusher type fan which sucks air from around base of plant, engine and generator, discharging out of housing through radiator at forward end of hood. Ignition, carburetor and controls readily accessible for servicing through side doors of hood.—D. W. Onan & Sons, Minneapolis, Minn.

HIGH-POWERED ELECTRIC SAW, HEAVY-DUTY MODEL, for fast easy one-handed operation, prepares lumber, composition board and soft metals for construction jobs and, when equipped with thin, abrasive disks instead of saw blades, cuts and scores tile, stone, brick, granite, marble, fibre and steel sheets. Cutting capacity, 2½-in. material at 90-deg. and 1¾-in. at 45-deg. bevel. Oversize uni-



versal electric motor drives arbor shaft through silent worm gears. Precision ball bearings only are used—three on motor shaft and two on arbor shaft. Saw blade totally inclosed in telescoping safety guard. Said to be particularly practical for residential contractors, car builders and factory maintenance men.—Syntron Co., 500 Lexington Ave., Homer City, Pa.



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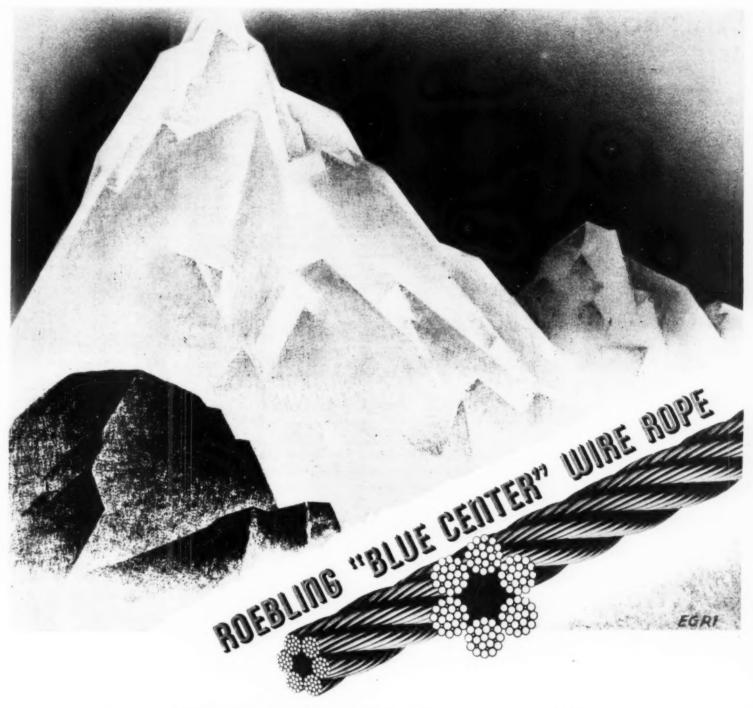
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These are the couplings contractors think of first when they want to be sure of absolute dependability at minimum cost! Designed for use on all makes of hand hammers and rock drills. Simple construction . . strong and durable . . easily installed. Cadmium plated — rustproof. Compact Type, Style WLD-7, ½" and ¾", Heavy Type, Style WHD-9, ¾" and 1".







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Except for stem and clamp, these are exactly the same as the "GJ-DIXON" Air Hammer Couplings described above. The alloy steel stem of the "GJ-BOSS" has a collar to engage the extending fingers of the sturdy malleable iron "BOSS" Clamp. Cadmium plated — ruterproof. Compact Type, Style XLB-61, V₂" and '4", Heavy Type, Style XHB-72, '4" and 1".

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Generally, these are the same in design and construction as "DIXON". Air Hammer Couplings, with the same steel spud and malleable iron wing nut. Like the "G.J-BOSS", however, they are equipped with the extra strong malleable iron "BOSS" Clamp, the fingers of which engage a collar on the steel stem.

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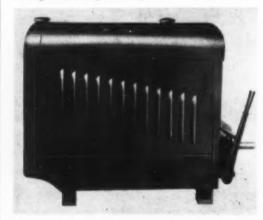
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HEAVY-DUTY ENGINES, 2- and 4-cylinder, radiator-cooled, ranging in size from 2 to 22 hp., have extra large anti-friction bearings, and a heavy and rigid crankshaft. Four-cylinder engines have three anti-friction main bearings. Tapered roller bearings are used in end position to carry thrust load. Large oil and graphine conventions permit languages of gasoline capacities permit long periods of



operation without attention. Gear oilers positively driven from crankshaft and assure lubrication so long as any oil remains in crank-case. Accessories: Complete electric starter and generator equipment; water circulating pump; fuel pump; lubricating oil pump and filter; combination carburetor for gaseous fuels and gasoline.—Novo Engise Co., Lansing, Mich.

NEWS FROM MANUFACTURERS About Their Products

The publications reviewed below, will keep you posted on latest developments in construction equipment and materials available for your use.



ROCK DRILLS — Ingersoll-Rand Co., Philipsburg, N.
J. (88 pp., illustrated.) Complete line of rock drills and associated equipment, together with a brief and interesting history of rock drill development. Installation and shop views, as well as tables of operating and physical characteristics for each class of machine are presented. Individual sections are devoted to jackhamers, paving breakers, drifters, stopehamers, wagon drifters, stopehamers, wagon drills, jackbits, drill steel, sharpeners (including threadforgers and shank and bit punches), jackmills and jackbit grinders and a variety of

other equipment including calyx core drills, Coroc diamond drills, submarine drills, explorer diamond drills. Eight pages of engineering tables and other useful data are also included in the book:

MUD-JACK — **Koehring Co.**, Milwaukee, Wis. (12 pp., illustrated.) Latest models in two sizes, the "50" for raising depressed concrete highway slabs and other large areas of concrete, and the "10" for lifting to proper grade concrete curb and gutter, sidewalk, street, alley, driveway and other small areas of concrete slab. Text describes methods of applying the result in the contraction of the state of the contraction of the state mud-jack and tells how maintenance costs are re-duced thereby. The various parts of the machine are duced thereby. The various parts of the machine are illustrated, including piston with rubber ring of mud pump, ball-valve for controlling discharge, two-way valve for two hose lines and mud hopper with spiral blade mixing element. Hints on proper preparation of concrete slab prior to mud-jacking, including location and spacing of drill holes through controls.

IRON VALVES—Jenkins Bros., 80 White St., New York, N. Y. (24 pp., 3½x6¼-in. size, illustrated.) A photographic study of iron valve types, analyzing

factors of valve life and maintenance. A 125-lb. re-grinding globe valve is disassembled, photographi-cally, part by part, to illustrate its various service features. Also illustrated are a 125-lb. regrinding swing check valve and a gate valve. Reference chart gives types, sizes and numbers for ordering.

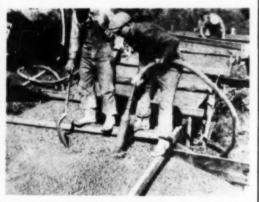
DIESEL TRACTOR — Caterpillar Tracter Co., Peoria, Ill. (32 pp., illustrated.) Describes Model D6 machine which has drawbar horsepower of 44.7. Detailed explanation of diesel engine that powers the tractor, with cutaway photographs and descriptive captions. Transmission and track construction are similarly handled in separate sections of booklet. Action photographs illustrate jobs tractor will do. Owner statements on costs and earnings.

WHITE LEAD PAINT — Lead Industries Association, 420 Lexington Ave., New York, N.Y. (28 pp., illustrated.) Helps for solving painting problems, presented with a minimum of technical language. Explains qualities of good paint and proper application necessary to obtain utmost service. Simplified white lead painting guide facilitates computation of amounts of paint ingredients needed. Mixing instructions for painting all surfaces, both interior and exterior. exterior.

CENTRIFUGAL PUMPS — Fairbanks, Morse & Co., Chicago, Ill. (24 pp., illustrated.) Complete line of single-stage split-case centrifugal pumps for capacities up to approximately 6,000 g.p.m. and for heads up to 280 ft. Line is divided into four groups of pumps for low, moderate, medium and high heads. A valuable feature of the bulletin is a series of tables for the selection of pumps to meet the selection of pumps to meet various requirements of ca-pacity and total head. Typical specifications, dimensions and hydraulic data also have been included.



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FAST

Several types are available -all place concrete fast and right. Sizes from 13/4" to 6"

in diameter make for the selection of the proper vibrator for every concrete placing job.

LOW COST

All Jackson vibrators are built to give the utmost in service.

Maintenance and repair costs are kept at the

WRITE FOR LITERATURE

ELECTRIC TAMPER & EQUIPMENT CO. LUDINGTON, MICHIGAN

New York City's NORTH BEACH AIRPORT has used 3,000,000 gallons of TEXACO Asphalt

for runways, taxiways, parking area and other surfaces



Photo by Fairchild Aerial Surveys, Inc., N. Y. C.



At North Beach, New York City is constructing a great, modern airport terminal, with accommodations for both land and sea planes. For the 1,250,000 square yards of runways, taxiways, parking area and other surfaces of this outstanding field, an Asphalt Macadam surface (penetration type) was selected. In every square yard of this surfacing, TEXACO Asphalt Cement has been used, requiring more than 3,000,000 gallons





Applying TEXACO Asphalt in front of Sea Plane Hangar, North Beach Airport.

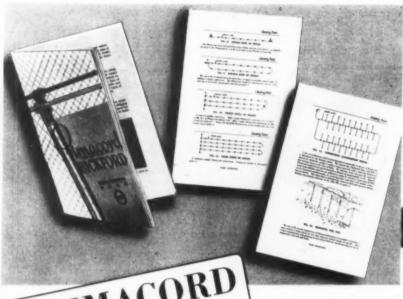


TEXACO Asphalt Macadam surface on Runway No. 1, which is 6,000 feet long and 400 feet wide.



TEXACO Asphalt Macadam apron in front of main administration building at North Beach Airport.

THE TEXAS COMPANY, Asphalt Sales Department, 135 E. 42nd St., New York City Chicago Cleveland Kansas City Philadelphia Houston Jacksonville Buffalo Richmond Boston



PRIMACORD ... the instantaneous detonating fuse for large and small blasts

Makers of Ensign-Bickford Safety Fuse since 1836

Whatever the size or type of blast, Primacord can be used with profit and increased safety. This insensitive fuse acts as the detonating agent in every hole, eliminating the use of caps in each load, and also connects all holes. It is practically instantaneous, yet permits desirable relief of burden. Strong, flexible and light in weight, it is easy to handle and profitable to use. Write for the useful Primacord-Bickford book.

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PRIMACORD BICKFORD Detonating fuse



Why insist on new wire rope for extra safety and anchor it with worn-out, inferior clips, shackles, turnbuckles and sockets? Why renew that chain for safety's sake and neglect the fittings for it? For that extra factor of safety, specify

LAUGHLIN DROP FORGED FITTINGS

Improved design adds strength with lightness; improved machinery in our new plant insures utmost precision; experienced craftsmanship and rigid inspection eliminates the menace of hidden weakness.

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"SAFETY" CLIP (Patented). A radical advance in clip design. TWO Bearing Saddles give 95.4% rope efficiency without crimping and weakening rope. Faster and foolproof because nuts are on opposite sides. Endorsed by leading insurance companies and wire rope manufacturers



THE THOMAS LAUGHLIN CO. PORTLAND - MAINE



- · ARE SIMPLE, COMPACT AND **ECONOMICAL**
- TWO AND THREE TON SIZES
- FOUR CYLINDER POWER UNITS
- EASY TO OPERATE

These rollers are ideal for blacktop driveways, tennis courts, etc., and for street patching. Send for Bulletin RST-39

Also Pumps, Saw Rigs, Hoists — a full line of construction anningered

C. H. & E. MANUFACTURING CO. 3847 N. Palmer St. Milwaukee, Wis. ers Mfg. Co., Milwaukee, Wis. (24 pp., illustrated.)
New Model S 4-cylinder unit, developing 64½ hp.
at drawbar, is de-



developing 64½ hp. at drawbar, is designed to take advantage of the extra power in high-octane (67 — 72) gasolines now available. Powered by high-compression engine with automatic spark advance and economizer carburetor, tractor er carburetor, tractor

power with low fuel consumption. Other features include super-seal rollers, manifold type cooling system. Gasoline consumption's per hour reported by owners are: 3 gal. for bulldozing, 4 gal. for heavy-duty grading, 5 gal. for scrapers. Five forward speeds up to 6.3 m.p.h. and constant mesh transmission. transmission.

REVERSIBLE RATCHET WRENCHES-Lowell Wrench REVERSIBLE RATCHET WRENCHES—Lowell Wrench Co., Worcester, Mass. (4-p. folder, illustrated.) Details of 24-in. safety-steel wrench tested to stand pull of 2,200 lb. Fully inclosed ratchet and parts with absolute crushing action on hardened steel pawls. Types include reversible ratchet socket wrench with handles from 1 to 5 ft. long, and flat-face bridge-builders ratchet wrench with handles from 2 to 3½ ft. long. Also sets of smaller Multiplex socket, wrenches socket wrenches

POWERED, BOTTOM-DUMP WAGONS — Euclid Road Machinery Co., Cleveland, Ohio. (12 pp., 11x 121/4-in. size, illustrated.) Pictorial presentation of application of Euclid powered bottom-dump wagons on a variety of earth-moving jobs. Load capacities from 9 to 12 cu.yd. Among design features of units are universal hitch for full right-angle turn, low, wide bodies for easy loading; air-controlled wheel wind for bottom-dump doors; big, traction-tread pneumatic tires

CARRYALL SCRAPERS—R. G. Le Tourneau, Inc., Peoria, Ill. (Two 8-p. booklets, illustrated.) Separate booklets covering large-capacity and small-capacity carryall scrapers, ranging in size from 3 to 30 cu.yd. Illustrations and text tell how machines handle job from beginning to end, including cuts, fills and finishing operations. Notes on use of pusher tractors for loading large scrapers.

EARTH MOVING EQUIPMENT—Caterpillar Tractor Co., Peoria, Ill. (16 pp., illustrated.) Historical sketch by F. A. Nikirk, discussing methods and equipment for highway grading during four periods: Hand labor and animal power era, 1919-23; gasoline power era, 1924-28; diesel power era, 1929-33; era of relinement in design and increased capacity, 1924-28. Includes production figures in cubic water. 1934-38. Includes production figures, in cubic yards per hour, for various types and combinations of machines.

BULLDOZER AND ANGLEDOZ-ER—R. G. Le Tourneau, Inc., Peoria, Ill. (8 pp., illustrated.) Applications of bulldozers and angledozers for widening county roads, uprooting stumps, pi-oneering for a flood control dam, trimming road shoulders and steep banks, grading freight yard terminal.



ROAD MAINTENANCE EQUIPMENT — Littleford Bros., Cincinnati, Ohio. (8-p. folder, illustrated.) Pressure distributors in several types and sizes, including truck-mounted and two-wheel trailer units for applying bituminous materials; wheeled rollers for motorized and hand operation; traffic-line markers in self-propelled and hand-pushed types; expansion joint filling machine; emulsion sprayers; tool boxes; torch burners; asphalt kettles and surface heaters; paving tools.

Here's Where "VENTUBE" is Needed On <u>EVERY</u> Tunnel Job



AND HERE'S WHY! Up at the heading is where you appreciate "Ventube"* rubberized ventilating duct most of all! It is lightweight and easy to handle—gets right up to the face where it can do an efficient job. Before blasting, the sections nearest the heading can be slid back to protect the tubing from flying rocks. Immediately afterwards, "Ventube" can again be slid into place—bringing you from a fan of proper capacity, fresh, pure air when you need it most—driving out dust and particle-laden stale air! "Ventube" is made of extra-heavy, long-fibered Hes-

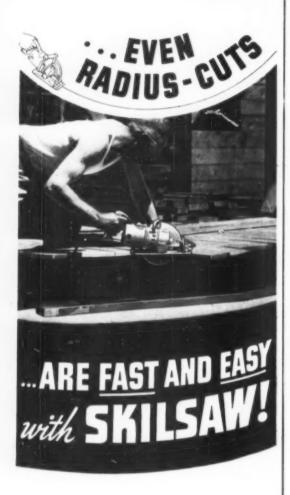
sian cloth that is both coated and impregnated with rubber that won't peel off. Acid, gases, fungus, moisture can't hurt it! And "Ventube" can withstand terrific concussions because it's as strong in the warp direction as in the filler. It's durable, flexible, time saving! All that is necessary besides "Ventube" to insure best ventilating results is a motor-driven fan of adequate capacity. We'll be glad to estimate on jobs you're figuring and show you how "Ventube" can help you speed up work and cut costs!

*"Ventube" is du Pont's reg. trade mark for its flexible rubberized ventilating duct.



E. I. DU PONT DE NEMOURS & COMPANY (INC.)
"FABRIKOID" DIVISION
FAIRFIELD, CONNECTICUT

THE FLEXIBLE VENTILATING DUCT



You may seldom need circular cuts—but when you do, SKILSAW can make them quicker and more conveniently than by any other method! That's because SKILSAW has plenty of torque and extra power to permit fast cutting against the added resistance of a curved line.

No other saw can give you all the costcutting, profit-making features of the Modern SKILSAW—developed through 19 years of constant improvement. It is lighter, better

balanced, more powerful, will do more sawing jobs. Cuts wood, metal, stone and compositions. Works from any light socket. 9 POWERFUL SIZES.

SKILSAW, INC. 5045 ELSTON AVENUE CHICAGO



Sold by leading distributors of mine, mill, hardware and contractors' supplies.



STEEL ANGLE COLUMNS

(Continued from page 47)

proof buildings, the eight-story fireproof structures possess numerous advantages, in the opinions of the architect and owner. Fireproof construction cuts maintenance to a minimum, permits the addition of two stories without materially increasing unoccupied area (thus curting land cost per room), and improves the appearance of the buildings by eliminating outside fire escapes.

According to the architect's estimate and cost records, buildings of this type can be constructed in single units for 45c. per cubic foot. Where there is more than one building unit, this cost can be slightly reduced. Fireproof construction of steel-frame buildings using angles for columns at Park Terrace Gardens was sufficiently economical to indicate gradual elimination of six-story, non-fireproof construction in New York City.

To the owner, who was also the builder of the apartment houses, the steel-frame design represented another advantage over competing types, especially over wall-bearing construction. The building trades under Mr. Rose's direction were able to maintain uninterrupted progress on the structures after the steel erectors had completed their work. Floor arches followed closely behind steel erection, and brick masons working on suspended scaffolds laid closure walls of 4-in. brick and 6 in. cinder backup block without interruption from grade line to roof. The cinder block backup later was waterproofed before being plastered.

Architecturally and economically, the angle columns enjoyed a further advantage in eliminating corner breaks in the rooms, as indicated by an accompanying photograph. The columns do not extend beyond the masonry walls. Absence of corner breaks improves the appearance of the rooms and saves the cost of additional interior work required by the breaks.

During construction and after completion, the fireproof design of the buildings protected them against losses by fire.

Steel for the five units was fabricated and erected by the Schacht Iron Works, Bronx, N. Y., which sublet shop fabrication of columns to the Belmont Iron Works.

UNDER-RIVER PIPE LINES

(Continued from page 51)

the time arrived to pull the pipe across, the marine derricks were maneuvered to take positions directly over the pipes. The main fall from the first derrick was then made fast to a structure at the heel of the riser bends by an equalizing wire rope cable sling designed for the purpose. The auxiliary fall from the first derrick was rigged to a similar structure about 20 ft. from the top of the riser bends. The main fall from the second derrick was attached to a cable sling 140 ft. behind the main fall of the first derrick. The stern boom and tackle was rigged to another sling 140 ft. aft of the bow of the second derrick, thus suspending 280 ft. of the pipe line.

It was estimated that with all of the pipe lines dragging on the bottom the friction of the skids on the bottom would amount to approximately 50,000 lb. It was decided to use a single cable on direct pull to tow the lines across the river, rather than a reeved block and cable, because of the possibility that the reeved cable would foul under the river. The power problem was solved with a marine type steam towing engine capable of a direct pull of 48,000 lb.

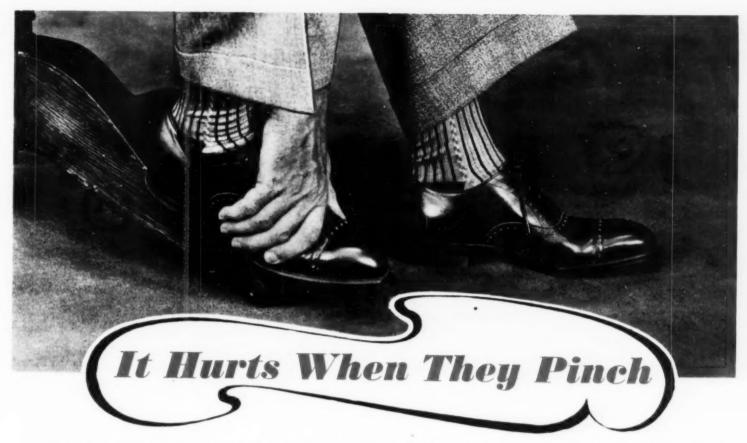
The 11/g-in. wire rope main cable was provided with a closed socket and shackle at the free end which was taken across the river from the east bank where the engine was located, and was

attached to a special cable sling, spreader beam and side bridle cables. The side bridle cables were attached to towing lugs welded to the 12-in. pipe 120 ft, back of the riser bends. The bridle cables allowed the main cable to change its angle as the pipe lines were pulled across to the east bank.

Pulling Operations — When all was in readiness for the pull across, the pipe lines were raised slightly off the bottom by the marine derricks, reducing the estimated friction of 50,000 lb. to an estimated maximum of 30,000 lb., well within the capacity of the engine and cable. The final pull started at 4:55 p.m. Saturday, July 1. As the pipe lines moved across the river a tug maneuvered the two marine derricks across the stream, keeping them lined up and in step with the moving pipe.

To provide against the possibility that the pull might prove unexpectedly heavy, a piledriver rig that had been preparing the east bank anchorage for the pipe lines stood by ready to assist by lifting additional sections of the lines from the river bottom by means of a 50-ft. cable sling attached to the pipes and a floating buoy. Possible failure of the engine or main cable was provided against by an auxiliary cable of the same type as the main cable, rigged through a 30-in. sheave block and leading to the hoisting drum of a bucket

(Continued on page 94)



Just as a tight shoe hurts the foot, so a "misfit" groove in a sheave or drum causes damage to wire rope. In one case, comfort is sacrificed-in the other, economy.

The illustration below shows a sheave groove that has been worn down fully 1/2 of an inch. The worn part of the groove is narrower than was the original groove contour-due to the rope also having been reduced in diameter by wear. As the proper size gauge does not go

to the bottom of this worn groove, a new full size rope put on this sheave in its present condition would be severely pinched and deformed.

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You will get longer rope service, and therefore greater economy, by using sheaves and drums with grooves of correct design and size. They should be large enough for the wire rope to fit into them easily without binding on the sides, but not too large, as such a groove will not give proper support to a rope.

When grooves wear deeper and

narrower...or when the tread becomes corrugated, they should be regrooved. Oftentimes it will pay to install new sheaves. Make it a rule to check your grooves for size and condition at regular intervals and especially before putting on a new rope.

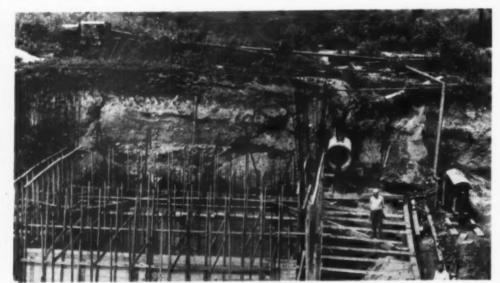
> The recommended diameter of groove for any given size rope is the nominal diameter plus a certain necessary clearance. Anything larger will not give adequate support to all ropes, and anything smaller will cause some ropes to be pinched. These groove diameters for various size ropes are as follows:



Nominal Diameter (d)	Proper Groove Diamete
0-3/4	d + 1/16
13/16-1-1/8	d + 5/64
1-3/16-1-1/2	d + 3/32
1-9/16-2-1/4	d + 1/8
2-5/16 & up	d + 3/16

This advertisement is published for the purpose of helping all wire rope users obtain safer and more economical service from their wire rope

KENNERLY AVENUE ST. LOUIS, MISSOURI, 90 West Street SAN FRANCISCO . 520 Fourth Street CHICAGO ' 810 W. Washington Blvd. PORTLAND POPE ONTE 914 N. W. 14th Avenue 1554 Wazee Street SEATTLE 3410 First Avenue South



Save Time Predrain Your Wet Job With a Save Money Moretrench Wellpoint System!

A copy of our 1939 catalog is yours for the asking.

CORPORATION MORETRENCH

90 WEST STREET, NEW YORK, NEW YORK



In stock at New York, Philadelphia, Baltimore, Atlanta, Hartford and Los Angeles GEORGE HAISS MFG. CO., INC., 139th ST. & CANAL PLACE, NEW YORK-DISTRIBUTORS EVERYWHERE dredge which was anchored upstream from the pipe-line crossing. However, neither of the precautions proved necessary. By 5:25 p.m. the lines were across the river and the riser bends were in position on the east bank.

The east bank anchorage of the pipe lines is an independent pile structure set back 40 ft. from the face of the bulkhead and wharf, so that while ships docking at the wharf may move the wharf structure the anchorage will be unaffected. On the west bank the pipe lines now rest on the bottom of the excavated cut, terminating 180 ft. inshore from the U. S. bulkhead line. Here a pile structure and concrete anchorage is being built. The pipes then will be raised from the bottom of the cut and placed on the anchorage.

ARC-WELDED **FACTORY** BUILDING

(Continued from page 65)

connected to the outstanding leg of the vertical web-members of the truss, eliminating punching of the top chord.

Each wing of the structure is served by an overhead, all-welded crane, traveling on one center and two side tracks. These tracks, (Fig. 4), are suspended from wide flanged beams which serve a two-fold purpose. In addition to supporting the tracks, these beams act as bottom chord struts and contribute materially to the stiffness of the structure. To facilitate erection and to make a more efficient connection, these beams are framed by setting them on top of the flange of the bottom chord. All columns and girts are of conventional welded construction. The shielded-arc process of electric welding was used and the welding equipment was supplied by the Lincoln Electric Co., Cleveland, Ohio.

The roof of the building consists of 2-in, wood deck with built-up roofing. The sides are covered with 26-gage corrugated sheets. The weight per square foot of floor area is approximately 81/2 lb. According to the builders, this is considerably less than would be the case with riveted construction.

The only equipment needed for the complete fabrication of all structural steel at the site was a punch and shear, a cutting torch and an electric arc-welding machine. All trusses were fabricated in a jig, (Fig. 5), made especially for this purpose. Fabrication of the other structural members was done after the trusses were completed.

A part of the construction included a 71/2-ton all-welded steel galvanizing kettle, (Fig. 6).

The new building was designed by Edward F. Simes of the Charles E. Schuler Engineering Co. and George P. Dysart of George P. Dysart, Inc. The latter was the general contractor for the work and D. E. Van Ness was in immediate charge of fabrication at the site.



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Inc. work ge of

HAS SURPASSED EVERY PROMISE MADE FOR IT

N 1937 we announced the A-W '99" as "The Greatest Motor Grader Ever Built." We promised that the versatility, capacity and maneuverability resulting from its five exclusive features-never before combined in one machine-would enable its operator to go places and do things far beyond the capacity of rear drive, front steer motor graders.

In two years of practical performance . . . representing hundreds of thousands of hours of operation by hundreds of users under the widest variety of conditions . . . the "99" has lived up to every claim made for it. Furthermore, with its extraordinary performance on "impossible" jobs, it has proved a money and time saver on routine motor grader work. Its increased effectiveness enables it to perform faster and cheaper than rear drive machines, giving it a wide range of new uses that keep it at work more days per year.

MAKE NO MISTAKE. NO MOTOR GRADER WHICH DOES NOT HAVE THESE FEATURES

PRECISION SIDE SHIFT... CONTROLLED TRACTION ... STABILIZED FRAME... ALL WHEEL STEER... ALL WHEEL DRIVE ...

CAN POSSIBLY EQUAL THE ALL 'ROUND, YEAR 'ROUND PERFORMANCE OF THE "99". IOB TEST PROOF IS YOURS FOR THE ASKING.

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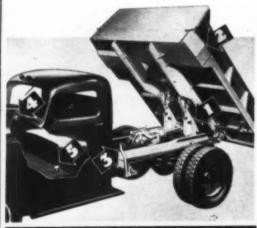
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Wisconsin Three-Lane Road

(Continued from page 56)

crete on both sides of each transverse joint and along the edge forms be vibrated with a mechanical vibrator having a minimum frequency of 3,600 r.p.m. The contractor met this specification by supplying two Roeth vibrators, each driven at 4,000 r.p.m. through a flexible shaft by a gasoline engine carried on a pneumatic-tired wheelbarrow frame.

After final floating and joint edging, the slab was cured under waterproof building paper for 72 hr. The contractor kept sufficient paper on the road to cover 2,800 lin.ft. of pavement, ample to assure curing for the period specified. An additional supply was held in dry storage on the job.

Working Force — With grading and paving in progress, an average working force included 91 men. Of this number, ten were executives and supervisors, six were skilled operators or mechanics, 22 (including truck drivers) were in the intermediate classification and 53 were unskilled laborers.

Administration — For the Wisconsin Highway Commission, E. L. Roettiger is state highway engineer and A. T. Bleck is construction engineer. All operations on the Griffith job and on three adjoining contracts were supervised for the Highway Commission by W. A. Sanborn, resident engineer.

J. R. Griffith was personally in charge of the work for the J. R. Griffith Co. Paving operations were directed by Tom Williams, paving foreman.

WINTER CONCRETING

(Continued from page 62)

be placed at a distance of 100 ft. or more from the scaffold, 4x6-in. posts were adequate for the guyed bents, but where proximity of the bluff made it necessary to place deadmen at minimum distances of 50 ft. from the scaffold, the 4x6-in. posts were doubled up to the top of the seventh tier, the point at which the second guy was attached. The curve of the scaffold bridges was found to provide effective arch action in resisting the wind load of prevailing westerly gales.

sisting the wind load of prevailing westerly gales.

Concrete Schedule — Construction progress as scheduled by the contractor called for completion of one floor each working day, or five floors in a full working week. Taking into account the days lost through snow and rain storms, this schedule was adhered to rather consistently through the most active part of the job, when four or five buildings were under construction simultaneously.

Columns, beams and slabs for one story took about 325 cu.yd. of concrete, a good day's output

(Continued on page 100)



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... COMPLETE LISTS COVERING

(Continued from page 98)

for a 1-cu.yd. mixing plant working on a 7-hr. shift. All concrete was vibrated by a Jackson gasoline-powered hydraulic internal vibrator, supplemented at times by another flexible-shaft vibrator of the rotary type, driven by a gasoline engine. The contractor placed column concrete at least 2 hr. ahead of slab to allow settlement.

Concrete Forms — To maintain progress at the rate scheduled, the constructors used two complete sets of forms per building. Erection of forms for the next floor started on the morning following a concrete pour.

Original plans had contemplated the completion of three buildings with six sets of forms, followed by use of the same forms on the two remaining buildings. When starting the job in accordance with this plan, the contractor purchased six sets of Haskelite 5%-in. gum plywood forms with the intention of reusing the forms on the other two buildings. Within a short time, the owner decided to push construction of the two remaining buildings, No. 1 and No. 2, and the contractor put one set of 5%-in. Douglas fir plywood slab forms on each of these units.

An accompanying chart of actual progress shows the lag in construction of these buildings during a period of less than two months when only one set of forms was in use on each structure. At the end of this period, the owner authorized the contractor to purchase a second set of Douglas fir slab forms and necessary column and beam forms to speed up construction, with resulting improvement in the two progress curves shown on the chart.

In all, the contractor had on the job ten sets of slab forms, ten sets of beam forms and five sets of column forms. In addition to about 125,000 sq.ft. of plywood, roughly 1,500,000 b.-ft. of other lumber was needed for forms, shores, scaffolds, ramps and other purposes.

Column forms were made up of Haskelite gum plywood and were used about eighteen times. Because of the change in plan, Haskelite slab forms were used only about seven times. Beam forms were constructed with 2-in. fir bottoms and 3/4-in. Ponderosa pine sides.

Winter Concrete — By preheating aggregates and mixing water and by providing adequate heat-protection for the forms, the contractor was able to place concrete at atmospheric temperatures as low as 25 deg. F., and to cure the slabs successfully even when temperatures during the following night dropped to 8 deg. No special ingredients or devices were used in accomplishing this result; the success was obtained through vigilant application of standard winter concreting practices.

Gravel and sand were delivered to the bins steaming hot by trucks of the Colonial Sand & Stone Co., which used canvas covers to conserve the heat during a 20-min, haul from the plant. Each concrete plant used mixing water at the rate of 1,500 gal, an hour. This water was heated by Aeroil kerosene-fuel heaters rated by the manufacturer as being capable of raising the temperature 100 deg, in 800 gal, per hour. Actually the two heaters kept the water close to steam temperature, and it was necessary to put a safety valve on the line to the street to save the street meter. A small standpipe on the line to the mixer was found effective in preventing opening of the safety valve.

on the heater as the result of water hammer set up by shutting off the mixer valve.

During its succession of transfers from mixer to tower bucket to tower hopper to carts to forms, the concrete lost a good portion of its heat and went into the forms at a temperature of about 60 deg, when everything clicked without a hitch. If any delay occurred in the series of operations, the temperature of the concrete when deposited in the forms was about 50 deg.

Heat-Protection — Pre-heating of the forms prevented freezing of the concrete and melted any snow which might otherwise have accumulated in the column forms, proving better for the latter purpose than tarpaulin covers which had been given a trial during the first part of the winter. The floor under the forms was completely inclosed with tarpaulins, and coke-burning salamanders were fired throughout the night preceding a pour.

For the floor inclosures, the contractor had a total of 250 tarpaulins, 15x20-ft. in size, made up on special order of 12-oz. canvas reinforced with diagonal ropes sewed into the tarpaulins to prevent tearing. Ordinarily a floor was heated by 45 salamanders, an average of one salamander for each 220 sq.ft. of slab.

In spite of the added reinforcement in the tarpaulins, the contractor lost fifteen of them on the worst night of the winter, with a 60-mi. gale blowing from the west and the temperature dropping to 8 deg. The night shift quickly replaced the lost tarpaulins and maintained a temperature of 120 deg. under the forms with an enlarged battery of 125 salamanders which burned 12 tons of coke during the night.

Because of the high winds in the exposed location, it was impossible to place any cover material on the fresh concrete slab. The wind was strong enough at times to lift runway sections off the short-leg horses resting on the forms while the day shift was placing concrete. No feasible cover material could have been kept on the slab overnight. As a result, the contractor left the slab uncovered and cured the concrete successfully by supplying heat from underneath.

Working Force—At the peak, the concrete contractor employed about 350 men on the job. The force could be broken down into four classifications about as follows: 140 carpenters, 40 lathers, 20 cement finishers and 150 laborers.

Structural Design — On the basis of cost figures developed by Victor Mayper, New York City, consulting engineer, the reinforced-concrete frame design for the five apartment houses and garage was about 15 per cent cheaper than steel framing with cinder concrete floor arches. The difference was largely attributable to a saving in floor-to-floor height in the concrete design, which dispenses with furred ceilings. These savings added up to practically a full story height in a twelve- or thirteen-story building.

George Fred Pelham, Jr. was the architect in charge of designing the entire project for Dr. Charles V. Paterno, the owner and builder.

Construction Management—Construction of the project was executed under the direction of Everett Winters, supervisor for Dr. Paterno. For Walter Kidde Constructors, Inc., New York City, concrete contractor, Charles W. Knowles is general superintendent. E. G. Robbins, superintendent, was in charge of the job.



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Dd

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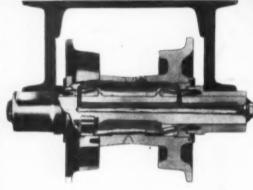


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